E-368

Insecticides (Cyanides)

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
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A BIBLIOGRAPHY OF CYANIDE COMPOUNDS USED AS INSECTICIDES, 1931

By

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United States Department of Agriculture

INTRODUCTION

This bibliography, the second of a series dealing with the insecticidal uses of cyanide compounds, was prepared by consulting the 1931 files of the following abstract journals:

British Chemical Abstracts
Chemical Abstracts
Chemisches Zentralblatt
Experiment Station Record
Physiological Abstracts
Quarterly Cumulative Index Medicus
Review of Applied Entomology, Series A
Review of Applied Entomology, Series B.

(1)

ANONYMOUS

ENTOMOLOGY. Ohio Agr. Expt. Sta. 49th Ann. Rept. 1929-1930, Bull. 470: 79-95. [Abstract in Rev. Appl. Ent. 19(A): 433. 1931.]

Against white grubs (Lachnosterna) in flower gardens, G. A. Filinger found that a solution of 8-10 oz. sodium cyanide in 50(U. S.) gals. water, sprinkled over the infested area at the rate of 2-1/2 gals. to each sq. yd. and washed off the plants one or two hours afterwards to avoid injuring them, gave good results.

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FUMIGATION FOR CONTROL OF SCALE INSECTS OF CITRUS TREES. N. S. Wales Dept. Agr. 1930. [Abstract in Rev. Appl. Ent. 19(A): 195. 1931.]

The best time of year for fumigation in New South Wales is from December to March, as the fruit is then small, and as it expands it will throw off the dead coccids. White wax scale (Ceroplastes ceriferus And.) is generally in the early stages of development in January and February and is easily killed, though later on control is far more difficult. In the case of red scale (Chrysomphalus aurantii Mask.) there is no evidence that mortality is higher from December to January than in late autumn and winter, but if fumigation is delayed until the fruit has nearly reached its full size, it will not become clean by picking time. It is, however, better to fumigate late than to leave trees infested until the following summer, though when the fruit is nearly ripe fumigation may cause it to fall. The pot method and the dust (calcium cyanide) method are described. Other methods include the use of a porous mineral earth impregnated with hydrocyanic acid which is kept in air-tight canisters, and merely scattered under the tent. Another method uses a high grade calcium cyanide compressed into small blocks which do not give off their gas until they are ground up and blown under the tent.

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INJURIOUS INSECTS AND OTHER PESTS. Kans. State Bd. Agr. Bien. Rept. 1929-1930: 103-118. [Abstract in Expt. Sta. Rec. 64: 852. 1931.]

It was observed that insects did considerable burrowing on the plats treated with various insecticides. All the arsenicals were injurious to plant growth. Sodium cyanide and paradichlorobenzene greatly reduced the yield. Most of the sodium compounds had a deflocculating effect on the soil, rendering it less permeable to water.

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RESEARCH IN FUMIGATION AND STERILIZATION METHODS. Fla. Agr. Expt. Rept. 1930: 86-87. [Abstract in Expt. Sta. Rec. 65: 454. 1931.]

In connection with toxicity studies by R. J. Wilmot and R. L. Miller a new and original method was designed by which insects in cotton stoppered glass tubes can be easily and quickly exposed to an atmosphere of known concentration of hydrogen cyanide gas. House flies were killed in 128 sec. by 0.34-0.40% hydrocyanic acid, and in 165 sec. by a 50% lower concentration.

ALLMAND, A. J., and CHAPLIN, R. (5)

ADSORPTION OF HYDROGEN CYANIDE AND OF CARBON DIOXIDE AT LOW PRESSURES BY ACTIVATED CHARCOALS. Roy. Soc. [London] Proc. Ser. A., 132: 460-479. 1931. [Abstract in Chem. Abs. 25: 5328. 1931.]

By use of a Pirani gage the adsorption isotherms of hydrocyanic acid were determined for four specimens of activated charcoal (evacuated) at 25°C. and over a pressure range of 0.001 to 0.2 mm. Hydrocyanic acid behaves in a manner similar to water. There are two distinct adsorption processes, of which both are active with steam- or air- activated charcoals, but only one is active with chemically activated charcoals. This difference is ascribed to the occupation of the regions of highest potential by mineral matter.

ANDREWARTHA, H. G. (6)

THE APPLE CURCULIO. Jour. Dept. Agr. West. Aust. 8(2): 106-114. 1931. [Abstract in Rev. Appl. Ent. 19(A): 467. 1931.]

As the weevils bury themselves at the base of the tree during the day, calcium cyanide might be applied in or on the soil around the trunk, but this would probably have to be repeated so often as to render its use uneconomical.

ANSON, M. L., and MIRSKY, A. E. (7)

REACTIONS OF CYANIDE WITH GLOBIN HEMOCHROMOGEN. Jour. Gen. Physiol. 14: 43-54. 1930. [Abstracts in Brit. Chem. Abs. 1930 (A): 1461.1930, Chem. Abs. 25: 125. 1931.]

Cyanide reacts with globin hemochromogen (1) without displacing or competing with globin, or (2) by displacing globin. The first compound is probably a typical hemochromogen; the second is probably a compound of cyanide with cyanide hemochromogen.

AVERSENO, JALOUSTRE, and MAURIN (8)

NEUTRALIZATION OF THE TOXICITY OF VARIOUS POISONS BY THORIUM X. Compt. Rend. 191: 734. 1930. [In French. Abstract in Chem. Zentbl. 102 (I): 813. 1931.]

Experiments show that thorium X greatly reduces the toxicity of various poisons, including the toxicity of potassium cyanide to fish.

BADGER, R. M., and BINDER, J. L. (9)

ABSORPTION BANDS OF HYDROGEN CYANIDE GAS IN THE NEAR INFRA-RED. Pysiol. Rev. 37: 800-807. 1931. [Abstract in Chem. Abs. 25: 3567. 1931.]

The absorption spectrum of gaseous hydrocyanic acid has been investigated in the region 7000-9200 A. U. Two weak bands of simple structure and having P and R but no Q branches were found at 7912 and 8563 A. U. The hydrocyanic acid molecule is linear in the normal state and has a moment of inertia $I = 18.79 \times 10^{-40}$ g. cm.^{2}. The distance between the carbon and nitrogen atoms is estimated as 1.15×10^{-8} cm. A discussion is given of the hydrocyanic acid molecule with regard to its three fundamental oscillations, its dissociation energy and dissociation products. The evidence shows that the molecular structure should be represented by the formula H-C-N and that the normal molecule is built from a normal hydrogen atom and a normal cyanide radical. No absorption bands could be detected in the photographic infra-red.

BALACHOWSKY, A. (10)

THE VALUE OF WHITE OILS IN THE CONTROL OF THE COCCIDS INJURIOUS TO THE AURANTIACEAE AND THE ORNAMENTAL PLANTS OF SOUTHERN FRANCE Rev. Path. Vég. et Ent. Agr. 17: 396-406. 1930. [In French. Abstract in Rev. Appl. Ent. 19(A): 249. 1931.]

The author reviews the advantages and disadvantages of various types of oil used as insecticides, and explains that hydrocyanic acid fumigations have largely taken the place of heavy oils in the treatment of citrus and other trees (in Southern France) in order to avoid injury to foliage.

BAMAG-MEGUIN A.-G. (11)

CATALYTIC OXIDATION OF AMMONIA, HYDROCYANIC ACID, ETC. French Patent

706,725, issued June 29, 1931; applied for November 29, 1930; in Germany October 4, 1930. [In French. Abstract in Chem. Zentbl. 102 (2): 1894. 1931.]

A platinum-rhodium alloy is used as catalyst.

BANCROFT, W. D., and RICHTER, G. H. (12)

CLAUDE BERNARD'S THEORY OF NARCOSIS. Natl. Acad. Sci. Proc. 16: 573-577. 1930. [Abstract in Chem. Abs. 25: 355. 1931.]

The theory that anesthesia is due to reversible coagulation of the proteins of the sensory nerves is thought to be supported by the fact that strychnine, mercuric chloride, and hydrocyanic acid produce, when in high dilution, increasing irritability instead of narcosis, this intermediate stage occurring as the proteins approach the point of instability.

BANGA, I., SCHNEIDER, L., and SZENT-GYÖRGYI. (13)

EFFECT OF HYDROCYANIC ACID ON TISSUE RESPIRATION. Biochem. Ztschr. 240: 454-461. 1931. [In German. Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

BARCROFT, J. (14)

THE TOXICITY OF ATMOSPHERES CONTAINING HYDROCYANIC ACID GAS. Jour. Hyg. [London] 31: 1-34. 1931. [Abstract in Chem. Abs. 25: 2201. 1931.]

The specific power of hydrocyanic acid gas to increase the total ventilation is an important factor in determining the specific toxicity of the gas. Man is relatively insusceptible to the inhalation of hydrocyanic acid. The time of exposure sufficient for collapse is about one-third of the fatal period of exposure. The extreme susceptibility of the canary makes it very valuable as an indicator of lethal concentrations where a chemical indicator is not available. Pigeons are as good since they vomit at the lethal concentration for the canary, although their lethal concentration is about twice as great. Treatment consists of artificial respiration, and the administration of glucose and nitrites.

BARKER, J. (15)

THE EFFECT OF HYDROGEN CYANIDE ON THE METABOLISM OF THE POTATO. Dept. Sci. Indus. Res. Rept. Food Investn. Bd. 1930: 61-64. [Abstract in Chem. Abs. 25: 4914. 1931.]

The exposure of potatoes to air containing small amounts of hydrocyanic acid considerably increased the carbon dioxide production and the oxygen uptake, the respiratory quotient remaining at its normal value of 1. Up to 0.5 cc. hydrocyanic acid per liter, no irreversible effects were produced, but at higher concentrations there was evidence of damage. The rise in metabolism was followed by a steady fall. The total sugar increased parallel with the metabolism during the rising phase, and decreased with the falling metabolism. It is concluded that hydrocyanic acid at first activates, and then inactivates, the amylase of potatoes, similarly to its action on barley amylase, and the increase in sugar production gives increased respiration.

BERNEWITZ, M. W. von (16)

THE SO-CALLED CYANIDE ECZEMA. Jour. Indus. Hyg. 13: 115. 1931. [Abstract in Chem. Zentbl. 102 (2): 3358. 1931.]

The skin affection occurring amongst gold-mine workers is not caused by cyanide poisoning, but is caused by the irritation from strong alkalies.

BETKE, H. (17)

HYDROCYANIC POISONING THROUGH SKIN. Zentbl. Gewerbhyg. Unfallverhüt. 18: 249. 1931. [In German. Abstract in Chem. Abs. 10: 358. 1931.]

BEUSCH. (18)

FUMIGATION WITH HYDROCYANIC ACID GAS AT THE CIVIC DISINFECTION INSTITUTE AT KÖNIGSBERG, PRUSSIA. Ztschr. Desinfektion 22: 723-725. 1930.

[In German. Abstract in Rev. Appl. Ent. 19 (A): 128. 1931.]

A description is given of a fumigation chamber in which hydrocyanic acid gas, produced by Zyklon B, is used to free furniture, etc, from such pests as clothes moths.

BHAGAVANTAM, S. (19)

RAMAN SPECTRA OF SOME TRIATOMIC MOLECULES. Nature 126: 995. 1930. [Abstract in Chem. Abs. 25: 1735. 1931.]

Photographs of the spectrum of liquid hydrocyanic acid show a triplet with shifts of 2076, 2097.2 and 2122, the middle component being much stronger than the others.

BOURDERIONNET, M. (20)

INSECTICIDE. French Patent 694,139 issued November 28, 1930; applied for April 18, 1930. [In French. Abstract in Chem. Zentbl. 102 (I): 3160.

1931]

An insecticide consisting of a mixture of liquid hydrocyanic acid with 3-6% oxalic acid as a stabilizer and 2-5% cyanogen bromide as irritant. The mixture can be stored or transported without danger in closed metal containers (inamelled or lacquered).

BRACKETT, F. S., and LIDDEL, U. (21)

INFRA-RED ABSORPTION BANDS OF HYDROGEN CYANIDE IN GAS AND LIQUID. Smithsn. Misc. Collect. 85 (5): 1-8. 1931. [Abstract in Chem. Abs. 25: 5349. 1931.]

A prism spectrograph of high resolution is described which was used to investigate the absorption spectrum of hydrocyanic acid in the liquid and gaseous phases. A value was found for the moment of inertia of the molecule in good agreement with Badger and Binder's value, and their conclusions are confirmed as to the arrangement of the atoms within the molecule, modes of vibration, etc.

BRATT, J. F. (22)

A CASE OF HYDROCYANIC ACID POISONING. Norsk. Mag. Laegevidenskap. 92: 159. 1931. [Cited in Quart. Cumulative Index Medicus 9: 337. 1931.]

BRAUNE, H., and ASCHE, T. (23)

THE DIELECTRIC CONSTANT AND DIPOLAR MOMENT OF HYDROCYANIC ACID AND CYANOGEN. Ztschr. Phys. Chem. 14(B): 18-26. 1931. [In German. Abstract in Chem. Abs. 25: 5804. 1931.]

The temperature coefficient of the dielectric constant of hydrocyanic acid and cyanogen was measured in the gaseous state. The values of the molecular polarization calculated from the equations $P = 12.63 + (51200/T)$ and $P = 12.62 + (566/T)$ for hydrocyanic acid and cyanogen, respectively, showed the dipolar moment to be 2.88×10^{-18} for hydrocyanic acid and 0.3×10^{-18} for cyanogen.

BREDIG, G., ELÖD, E., and DEMME, E. (24)

CATALYTIC FORMATION OF HYDROCYANIC ACID. II. FORMATION OF HYDROCYANIC ACID FROM HYDROCARBONS AND AMMONIA. Ztschr. Elektrochem. 36: 991-1003. 1930. [In German. Abstract in Chem. Abs. 25: 1176. 1931.]

The action of ammonia on ethylene, acetylene, and methane in the presence of catalysts was investigated. At temperatures above 700°C. hydrocyanic acid formed, the yield rising through a maximum with increasing temperature. Under given conditions the hydrocyanic acid yield is highest with ethylene. The reaction between ammonia and ethylene is a catalytic surface reaction, catalyzed preferably by a mixture of quartz and clay or by pure clay. The highest yields of hydrocyanic acid, based on ammonia used, were from the proportions $NH_3:C_2H_4 = 1:1$. The action of ammonia on ethylene or methane is not direct, but by disproportionation of the hydrocarbon, e.g., $C_2H_4 = 2C + 2CH_4$. Both reactions can be influenced by hydrogen or methane addition. The relation of hydrogen formed to methane formed depends upon temperature, but at the best temperature of 800°C. it is quite independent of gas velocity. In the action of ammonia on ethylene the hydrocyanic acid yield is independent of duration of contact within the limits investigated. Methane forms hydrocyanic acid only at temperatures at which the thermodynamic conditions for ethylene formation are present. It is probable that hydrocyanic acid formation from ethylene and ammonia, or methane and ammonia, proceeds by means of the intermediate formation of ethylene.

BREDIG, G., ELÖD, E., and KÖNIG, W. (25)

CATALYTIC FORMATION OF HYDROCYANIC ACID. V. CERIUM OXIDE AS CATALYST IN THE FORMATION OF HYDROCYANIC ACID. Ztschr, Elektrochem. 37: 2-11. 1931. [In German. Abstract in Chem. Abs. 25: 1177. 1931.]

The formation of appreciable quantities of cerium nitride, cerium hydride or cerium carbide as intermediate products of reaction gas and catalyst during catalysis of hydrocyanic acid from carbon monoxide and ammoni does not come into consideration. Ammonia formation by the action of nitrogen and hydrogen upon metallic cerium is comolete only in the oresence of oxygen and with simultaneous oxidation of cerium to cerium oxide. It was determined by X-rays that cerium oxide during catalysis suffered neither change of crystal structure nor lattice arrangement. Apparently the formation of hydrocyanic acid from carbon monoxide and ammonia takes place via nascent, free carbon. On this basis, the course of the reaction is shown. Under the conditions, no ammonium cyanate is formed as intermedia product in the formation of hydrocyanic acid. There is apparently a relatio between crystal size, adsorption power, and catalytic activity of cerric oxides of the same properties, which have undergone various preliminary treatments.

BREDIG, G., ELÖD, E., and KORTÜM, G. (26)

CATALYTIC FORMATION OF HYDROCYANIC ACID. IV. FORMATION OF HYDROCYANIC ACID FROM CARBON MONOXIDE AND AMMONIA. Ztschr. Elektrochem. 36: 1007-1023. 1930. [In German. Abstract in Chem. Abs. 25: 1176. 1931.]

Increasing the excess of carbon monoxide favors hydrocyanic acid formation more than increasing the amount of ammonia. Addition of nitrogen causes merely a slowing down of the reaction. Hydrogen and carbon dioxide affect unfavorably the apparent equilibrium of hydrocyanic acid formation, carbon dioxide more so than hydrogen. Addition of hydrogen reduces decomposition of ammonia into its elements. Moisture hinders hydrocyanic acid formation, not by displacing the equilibrium but by a secondary saponification of hydrocyanic acid. The most probable main reactions are: $2CO + NH_3 = HCN + CO_2 + H_2$ $CO_2 + H_2 = CO + H_2O$; with the following partial reactions: $2CO = C + CO_2$, $C + NH_3 = HCN + H_2$. Carbon does not separate in solid form, else it would coat the catalyst. The reaction of hydrocyanic acid with water was investigated, but no definite conclusions were reached. Tests were made for intermediate formation of formamide, but this was unstable at the temperature used.

BREDIG, G., ELÖD, E., and MÜLLER, R. (27)

CATALYTIC FORMATION OF HYDROCYANIC ACID. III. FORMATION OF HYDROCYANIC ACID FROM CARBON MONOXIDE AND AMMONIA. Ztschr. Elektrochem. 36: 1003-1007. 1930. [In German. Abstract in Chem. Abs. 25: 1176. 1931.]

The reaction between ammonia and carbon monoxide was investigated at 500°, 600°, and 700° C. The catalysts used were oxides of aluminum, thorium, and cerium, the first without support and on broken stoneware, the second in admixture with aluminum oxide without support, the last with and without support. The best hydrocyanic acid yields were with aluminum oxide without support and with cerium oxide on stoneware support.

Silica gel and admixtures with aluminum oxideand thorium dioxide were unsatisfactory. With cerium oxide on stoneware the hydrocyanic acid yields, based on ammonia used, increase with temperature rise and carbon monoxide excess, but diminish on increase in velocity. With a 20-fold excess of carbon monoxide and velocity of 12 liters per hour, or duration of contact 0.1 min. at 700°C., about 65% of the ammonia is converted into hydrocyanic acid with simultaneous ammonia loss of 14% due to dissociation. With a 10-fold excess of carbon monoxide the maximum yield at 700° C. was about 48%; with 5-fold about 34%. Dissociation of ammonia is about 25-20% of the hydrocyanic acid yield; at 500°, 2-6%; at 600°, 5-12%; at 700° C., 7-18%. From analyses of the final gases no conclusions can be drawn as to ammonia dissociation. The reactions $NH_3 + CO \rightleftharpoons HCN + H_2O$, and $H_2O + CO \rightleftharpoons H_2 + CO_2$ take place together.

BRUNETEAU, J. (28)

THE CLOTHES MOTHS. Rev. Zool. Agr. et Appl. 29: 149-159. 1930. [In French. Abstract in Rev. Appl. Ent. 19(A): 422. 1931.]

An account of the bionomics and control of the clothes moths, with notes on insecticides tested by the author against T. tapetzella at 22°C. In addition to carbon bisulphide, chloropicrin and hydrocyanic acid, fresh pyrethrum powder and naphthalene were very effective. All eggs, larvae, and adults being killed in 24 hrs. by heavy dusting with the former and by the latter at the rate of about 4 oz. to 10 cu. ft.

BUCHANAN, G. H. (29)

PRESENT STATUS OF THE PREPARATION OF CYANIDES FROM CYANAMIDE; THE FIELD OF USEFULNESS OF CYANIDES. Trans. Amer. Electrochem. Soc. 60: (preprint) 20 pp., 1931. [Abstract in Chem. Zentbl. 102 (II): 3543. 1931.]

A review.

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INSECTICIDE AND FUMIGANT. United States Patent 1,795,593, issued March 10, 1931; applied for April 23, 1926; assigned to American Cyanamid Co. Abstract in Brit. Chem. Abs. 1931(B): 1124. 1931.

Calcium cyanamide and sodium fluoride are fused in an electric furnace at 1400°C. and the product is cooled rapidly below 400°C. With an excess of sodium fluoride, leaching the fused mass affords a solution of sodium cyanide. With only a small amount of sodium fluoride the product consists mainly of calcium cyanide.

BURRELL, A. B., and PARRIS, G. K. (31)

INJURY TO APPLE TREES FROM THE USE OF A CALCIUM CYANIDE, RAW LINSEED OIL MIXTURE IN CONTROLLING THE ROUND-HEADED APPLE-TREE BORER. Jour. Econ. Ent. 24: 711-716. 1931. [Abstract in Chem. Abs. 25: 4348. 1931. Expt. Sta. Rec. 65: 854. 1931.]

Tree injury is described which resulted from the use of this mixture in the control of *Saperda candida*. Injury was found to be most severe when the cambium was exposed by cutting out part of the borers before the material was applied. The use of some oil other than raw linseed may perhaps reduce the danger of injury to the tree.

CALIFORNIA CYANIDE CO., INC. (32)

INSECTICIDAL MATERIAL. Norwegian Patent 45,807, issued November 12, 1928; applied for November 2, 1926. [In Norwegian. Abstract in Chem. Zentbl. 102 (II): 761. 1931.]

A material consisting of alkali- or alkaline earth-cyanide in chemical combination with hydrocyanic acid. For example $Ca(CN)_2 . 2HCN$.

CAMP, A. F., and WILMOT, R. J. (33)

FUMIGATION RESEARCH IN FLORIDA. Fla. State Plant Bd. Monthly Bull. 15 (Nos. 5-8): 1-35. 1931. [Abstract in Rev. Appl. Ent. 19(A): 314. 1931.]

An investigation of hydrocyanic acid fumigation as applied in the field showed that failure to obtain insect kill was primarily due to low concentrations of the gas, owing to leakage and absorption by the load. Methods of offsetting these difficulties are reported, including a metal fumigatorium with an agitating system, and a fractional method of applying the fumigant so as to compensate for absorption. Some data are given on the toxicity of hydrocyanic acid to certain insects.

CÁNOVAS GARCÍA, C. (34)

FUMIGATION WITH LIQUID HYDROCYANIC ACID. Bol. Agr. Tec. y Econ. [Spain] 22: 345-350. 1930. [In Spanish. Abstract in Rev. Appl. Ent. 19(A): 19. 1931.]

Liquid hydrocyanic acid was first used for the fumigation of *Citrus* on a commercial scale in California in 1917 and in Spain in 1924. The method is described, with data relating to its application for controlling various Coccids in Spain.

CARLISLE, P. J., and DANGELMAJER, C. (35)

FUMIGANT. Canadian Patent 314,635, issued August 25, 1931; applied for October 7, 1929. Assigned to Roessler and Hasslacher Chemical Co. [Abstract in Chem. Abs. 25: 5526. 1931.]

Anhydrous ammonium cyanide is admixed in sufficient amount with a product containing calcium cyanide to accelerate the evolution of hydrocyanic acid upon exposure to the atmosphere.

CARLOS, A. S. (36)

PREPARATION AND APPLICATION OF INSECTICIDES AND FUNGICIDES. Fert. Feeding Stuffs and Farm Supplies Jour. 15: 749-750. 1930. [Abstract in Chem. Zentbl. 102 (I): 2105. 1931.]

A discussion of the preparation and application of various insecticides and fungicides, including hydrocyanic acid.

CHAPMAN, P. J., PARKER, M. M., and GOULD, G. E. (37)

THE *EUONYMUS* SCALE. Jour. Econ. Ent. 24: 764-765. 1931. [Abstract in Rev. Appl. Ent. 19(A): 551. 1931.]

Chionaspis euonymi Comst. has caused serious injury to *Euonymus* in Virginia for the past 50 years and is now practically the only factor limiting the cultivation of this shrub. Good control was obtained by two fumigations with hydrocyanic acid generated from Cyanogas "A".

CHEN, T., and PAK, C (38)

RESISTANCE OF OMNIVEROUS AND VEGETARIAN RATS AGAINST CERTAIN POISONS. Chinese Jour. Physiol. 4: 289-294. 1930. [In Chinese. Abstract in Chem. Abs. 25: 143. 1931.]

Omniverous and vegetarian rats are equally resistant to strophanthin and strychnine sulfate subcutaneously injected. Vegetarian rats are twice as resistant to ephedrine-hydrochloride and slightly more resistant to morphine-hydrochloride,sodium cyanide, and methyl cyanide.

COATES, J. E., and HARTSHORNE, N. H. (39)

STUDIES ON HYDROGEN CYANIDE. III. THE FREEZING POINTS OF HYDROGEN CYANIDE-WATER MIXTURES. Jour. Chem. Soc. [London] 1931: 657-665. [Abstract in Chem. Abs. 25: 3229. 1931.]

With the aid of the freezing-point diagram, the solid-liquid equilibria of the system $HCN-H_2O$ are studied. The system contains a single eutectic lying at -23.4°C. and 74.5 mole% hydrocyanic acid. On the hydrocyanic acid side of the freezing-point diagram the normal molecular weight of water is given within 2% by the freezing point of a solution containing 99 mole% hydrocyanic acid. On the water side the curve is linear up to 9.1 mole% hydrocyanic acid. This branch shows a marked inflection at 35 mole% hydrocyanic acid and -16.0°C. suggesting a metastable two-liquid phase region, which was found. The critical solution temperature is near-24.0°. from the curve, the critical composition corresponding with that of the inflection (35 mole% HCN). Two kinds of metastable crystals were found: (1) the rapid-growing, dendritic type, considered to be hydrocyanic acid; and (2) the compact, slow-growing type, considered to be a compound of hydrocyanic acid and water. The limited miscibility of hydrocyanic acid and water at low temperatures agrees with the large deviation from ideality in the partial vapor-pressure measurements of Shirado (Chem. Abs. 21:2411). Also, this system fits into the nitrile series with regard to its critical solution temperature.

COUTINHO SARAIVA, A (40)

THE ROLE OF FUMIGATION IN THE ECONOMICS OF CITRUS CULTURE. Bol. Agr. e Pecuario, Mozambique 1930: 47-55. [In Portuguese. Abstract in Rev. Appl. Ent. 19(A): 599. 1931.]

A popular article on the fumigation of citrus trees in Mozambique with hydrocyanic acid against coccids. The species found in the colony are *Chrysomphalus* (*Aspidiotus*) *aurantii* Mask., *C. ficus* Ashm., *Lepidosaphes beckii* Newm. (*Mytilaspis citricola* Pack.), L. (*M.*) *gloveri* Pack., *Coccus* (*Lecanium*) *hesperidum* L. and *Saissetia* (*L.*) *nigra* Nietn.

CURTMAN, L. J., and EDMONDS, S. M. (41)

DETERMINATION OF THE ACIDS OF THE CHLORIDE GROUP IN THE PRESENCE OF THIOSULFATE. Chem. News. 142: 337-338. 1931. [Abstract in Chem. Zentbl. 102 (II): 879. 1931.]

The determination of the anions Cl^-, Br^-, I^-, CN^-, CNS^-, $Fe(CN)_6^{\equiv}$, $Fe(CN)_6^{\overline{\equiv}}$ and $S^=$ by precipitation as the silver salt in 10% nitric acid fails to work in the presence of $S_2O_3^=$. A procedure is described which detects as little as : 1 mg. Cl^-, Br^-, $Fe(CN)_6^{\equiv}$; 2 mg. I^-; 5 mg. CN^-; 10 mg. CNS^-.

DADIEU, A. (42)

STUDIES IN RAMAN EFFECT. XI. RAMAN SPECTRA OF ORGANIC SUBSTANCES (CYANOGEN COMPOUNDS). Monatsh. Chem. 57: 437-468. 1931. [In German. Abstract in Chem. Abs. 25: 4794. 1931.]

The most significant fearure for comparing the Raman spectra of cyanide compounds is the frequency of the $C\equiv N$ group, somewhat variable according to combination, but only within the extreme limits 2050 and 2350 per cm., well inside of the region 1900-2400, which according to previous experience is reserved for vibrations of triply bound atoms. The presence of the $C\equiv N$ line in isonitriles and mustard oils indicates that the classical valence formulas for these compounds, assuming double bonds only, are misleading, and that the real structures are something more like $R-N\equiv C$ and $R-N\equiv C-S$. On the other hand, the absence of the $C\equiv N$ frequency in isocyanates supports the classical formulation $R-C\equiv N=O$. The Raman spectrum of hydrocyanic acid exhibits the lines 2094 and 2062, the former much the stronger. The line 2062 indicates that the isomer HNC is present in an estimated concentration of 0.5% at room temperatures.

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THE CONSTITUTION OF PRUSSIC ACID. Naturw. 18: 895. 1930. [In German. Abstract in Chem. Abs. 25: 874. 1931.]

The Raman spectrum of pure dehydrated hydrocyanic acid was again determined. Besides the known frequency of 2094 $cm.^{-1}$ (intensity 12), two weak bands at 2062 (1/2) and 3220 (2) $cm.^{-1}$ were found. The 2062 line is not due to dissociation. It is assumed that 3220 is a vibration of hydrogen with respect to CN with increased C-H frequency due to triple bond. The other two lines are due to the two isomeric forms of hydrocyanic acid; 2094 to normal hydrocyanic acid, 2062 to the isonitrile form. For the latter a triple bond is thereby indicated: $H-\overset{+}{N}\equiv\overset{-}{C}$, in agreement with the results of Lindemann.

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RAMAN EFFECT AND CONSTITUTIONAL PROBLEMS. II. CYANOGEN COMPOUNDS. Ber. 64B: 358-361. 1931. [In German. Abstract in Chem. Abs. 25: 2364 1931.]

The constitution of hydrocyanic acid can be decided on the basis of Raman spectra. Frequencies of 2094, relative intensity (12), and 2062, (1/2), indicate both HCN and HNC, the isocompound being present in the order of magnitude of 1/2%.

DECKERT, W. (45)

A DEVICE FOR THE DETERMINATION OF THE SMALLEST QUANTITIES OF HYDROCYANIC ACID IN THE AIR BY THE BENZIDINE-COPPER ACETATE REACTION. Ztschr. Desinfekt. 22: 65, 81-86. 1930. [In German. Abstract in Chem. Abs. 25: 4489. 1931. Chem. Zentbl. 102 (I):1833. 1931.]

Twenty-five cc. of air is pressed through a filter disk wetted with benzidine-copper acetate solution. The tint is compared with a color scale. Two-thousandths mg. hydrocyanic acid can thus be detected and 4 to 600 mg./cu.m. can be determined with an accuracy of ± 25%.

------- (46)

RECENT ADVANCES IN MILL FUMIGATION WITH HYDROCYANIC ACID. Mühle 68: 526-527. 1931. [Abstract in Chem. Zentbl. 102 (I). 3598. 1931.]

Suggestions are given for unobjectionable fumigation with hydrocyanic acid. The concentration is controlled by the use of absorbent disks that readily evolve hydrocyanic acid when distributed about the rooms.

DELASSUS (47)

ALGERIA: PINK BOLLWORM OF COTTON. Internatl. Bull. Plant Protect. 5: 4-5. 1931. [Abstract in Rev. Appl. Ent. 19(A): 188. 1931.]

The pest occurs in all cotton growing districts in Algeria, although the intensity of infestation varies in different places. Decrees prescribe the disinfection of seed, at one fumigation center, by means of hydrocyanic acid.

DESCHAMPS, G. (48)

PREPARATION OF FORMAMIDE AND ITS CONVERSION INTO HYDROCYANIC ACID. Chim. et Indus., Special No., 589-597 (March, 1931). [In French. Abstract in Chem. Abs. 25: 3620. 1931.]

Several methods are discussed for preparing formamide. Dehydration of liquid formamide by phosphorous pent oxide yielded 17.8-21.6% hydrocyanic acid; by phosphorous pentachloride, 28.32% hydrocyanic acid; by fused potassium hydroxide at 330-340°C., 28.3% hydrocyanic acid; by acetic anhydride, about 1%; by acetic anhydride in presence of iron reduced by hydrogen, practically no hydrocyanic acid was evolved but considerable ferrocyanide was formed; by p-toluenesulfonic acid, thorium oxide, cuprous sulfate (anhyd.), aluminum chloride, and fused zinc chloride, practically no hydrocyanic acid was formed. Passing formamide vapors at atmospheric pressure through a quartz tube heated to 830-840°C. yielded 31.8% hydrocyanic acid; under pressure of 380 mm. at 840-850°. the yield was 36.4% (about 50% of theory); at higher temperature the hydrocyanic acid yield decreased; in presence of thorium oxide under a pressure of 380 mm., at 430°C., the hydrocyanic acid yield was 17.7%, at higher temperatures the yield decreased; at 380 mm. and 475° in presence of aluminum oxide the hydrocyanic acid yield was 11.8%; at 400-420° and 380 mm. in presence of sand the hydrocyanic acid yield was 15.4%; in presence of iron reduced by hydrogen at not over 450°. the yield was 57.6% at 450-475°. 26.2% at 600°. 23.5% at 360° and 15.4% at 325°C.; using an iron instead of quartz tube, the yield in presence of reduced iron was 44.76% at about 400°C.; with reduced iron on pumice stone 42.6% hydrocyanic acid was obtained at 500°C; at 380 mm. in presence of aluminum, the yield was 57.7% at 500° and 11.4% at 350°; at 380 mm. and 500°C. in presence of zinc powder the yield was 50.7%; at 380 mm. in presence of commercial copper powder the yield was 32.7% at 475°C. and 32.2% at 500°C; at 380 mm. an 440°C. the yield was only 9.4% in presence of copper-nickel, and considerab quantities of carbon monoxide and ammonia are formed. The patents on the manufacture of formamide are briefly reviewed, as are also its principal use

DEUTSCHE GOLD- UND SILBER- SCHEIDEANSTALT VORMALS ROESSLER. (49)

INSECTICIDES. German Patent 517,631, issued February 9, 1931; applied for July 21, 1925. [Abstract in Chem. Zentbl. 102 (I): 2924. 1931.]

An insecticide consists of hydrocyanic acid containing just enough chloropicrin to produce a reliable irritant effect.

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STABILIZING HYDROCYANIC ACID. German Patent 517,918, issued February 9,193 applied for July 4, 1925. [In German. Abstract in Chem. Abs. 25: 2817. 1931.]

Hydrocyanic acid is rendered stable by adding such organic halogen compounds (excepting irritants) which split off acid residues under the given conditions. Examples are dichlor-, trichlor-, tetrachlor-ethylene, chloroform, etc.

------- (51)

RENDERING POISONOUS GASES PERCEPTIBLE. German Patent 524,261 issued May 12, 1931; applied for January 17, 1928. [In German. Abstract in Chem. Ab 25: 3745. 1931.]

In fumigating, etc., with hydrocyanic acid, etc., the poisonous gases are mixed with at least two warning substances, one of which, e.g., cyanogen chloride or cyanogen bromide, is readily volatile and acts at the beginning of the operation, while another, e.g., chloropicrin or bromoacetophenone, is difficulty volatile and continues to act until all the poisonous gas has dispersed. The warning substances may be generated at the place of use.

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ACCELERATING THE RATE OF DECOMPOSITION OF CALCIUM CYANIDE INTO HYDROCYANIC ACID AND CALCIUM HYDROXIDE OR CARBONATE. German Patent 533,937, issued September 21, 1931; applied for October 11, 1929; in United States October 15, 1928. [Abstract in Chem. Zentbl. 102 (II): 3042. 1931.]

Ammonium cyanide is added to accelerate the rate of decomposition. The finely powdered, dry materials may be mixed, or suitable amounts of hydrocyanic acid and ammonia may be added and the ammonium cyanide thus formed directly along with the calcium cyanide.

DJATSCHKOWSKI, S.I., and ISSAJENKO, T. I. (53)

NEW METHODS FOR QUALITATIVE DETECTION OF ACIDS. Chem. Jour. Ser. A. Jour. Allg. Chem. (Russia) 1(63): 81-84. 1931. [Abstract in Chem. Zentbl. 102 (II): 1165. 1931.]

The proposed methods indicate the presence of anions in mixtures with the use of but one drop of the substance, and are based upon the electrolysis of the salts. A strip of filter paper is moistened and clamped between electrodes; the substance being tested is dropped on the paper near the cathode and a suitable reagent is dropped on near the anode. Characteristic reactions occur at intermediate points on the filter paper, depending upon the relative ionic migration velocities. A test is described for the cyanide ion.

EDDE, F. H. (54)

HYDROCYANIC ACID. French Patent 705,580, issued June 10, 1931; applied for November 14, 1930. [In French. Abstract in Chem. Abs. 25: 5253. 1931.]

Gaseous hydrocyanic acid is liberated at as high a temperature as possible by using the action of a dilute acid on a solution of an alkali cyanide. An acid is used which on dilution in water evolves heat, and it is brought while still hot in contact with the cyanide solution.

EDDY, N. B. (55)

REGULATION OF RESPIRATION. EFFECT OF INTRAVENOUS INJECTIONS OF SODIUM SULFIDE, SODIUM CYANIDE AND METHYLENE BLUE UPON SALIVARY SECRETION. Jour. Pharmacol. and Expt. Ther. 41: 435-447. 1931. [Abstract in Chem. Zentbl. 102 (II): 3508. 1931.]

Sodium cyanide causes a diminished salivary secretion and a reduced oxygen consumption. Methylene blue causes an increased salivary secretion; increased blood circulation and blood pressure, increased frequency of respiration, and increased oxygen consumption.

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(56)

REGULATION OF RESPIRATION. THE ANTAGONISM BETWEEN METHYLENE BLUE AND SODIUM CYANIDE. Jour. Pharmacol. and Expt. Ther. 41: 449-464. 1931. [Abstract in Chem. Abs. 25: 4939. 1931.]

Sodium cyanide given to anesthetized dogs after injection of methylene blue had little or no effect on respiration, blood pressure or salivary secretion. An animal could survive a normally fatal dose of sodium cyanide if methylene blue was administered 10 minutes before or not more than 2 minutes after the sodium cyanide.

EDWARDS, W. H.

(57)

REPORT OF THE GOVERNMENT ENTOMOLOGIST. Ann. Rept. Jamaica Dept. Agr. 1930: 20-21. [Abstract in Rev. Appl. Ent. 19(A): 628. 1931.]

Experiments in tent fumigation with hydrocyanic acid (against coccid attacking Citrus) showed that the treatment can be carried out in daylight in the autumn.

ELVEHJEM, C. A.

(58)

THE ROLE OF IRON AND COPPER IN THE GROWTH AND METABOLISM OF YEAST. Jour. Biol. Chem. 90: 111-132. 1931. [Abstract in Chem. Zentbl. 102 (II): 1871. 1931.]

In cultures 48 hrs. old at least 80% of the respiration could be stopped by potassium cyanide. With increasing age of the culture the effect of potassium cyanide diminished, so that after 7 days the respiration was not affected by potassium cyanide. Such a potassium cyanide stable culture digests glucose, is destroyed by heating to 60°C. and may be inhibited as much as 70% by urethane. Potassium cyanide strongly inhibits the respiration of yeast grown on beer wort.

EMDE, H., and HORNEMANN, T.

(59)

HYDROCYANIC ACID FROM METHYLAMINE AS A LECTURE EXPERIMENT. Ztschr. Angew. Chem. 44: 278. 1931. [Abstract in Chem. Zentbl. 102 (II): 373. 1931.]

A concentrated aqueous solution of methylamine is atomized into a bunsen flame which is directed against an ice cube standing on a wire gauze over a funnel. The ice-water gives a reaction for hydrocyanic acid.

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(60)

CYANIDES, THIOCYANATES AND METHYL AMINE. Arch. Pharm. u. Ber. Deut. Pharm. Gesell. 269: 336-340. 1931. [Abstract in Chem. Zentbl. 102 (II): 3459. 1931.]

A review of the literature relating to the neutralization of the poisonous action of hydrocyanic acid within the animal organism. Experiments were made to test whether there may be a biogenetic relation between hydrocyanic acid and methylamine in the sense of the equation: $CH_3NH_2 + O_2 = HCN + 2H_2O$. Using an excess of methylamine sulfate the following reaction was found to occur: $3CH_3NH_2 + 4Cr^{O}{}_3 + 6H_2SO_4 = 3HCN + 2Cr2(SO_4)_3 + 12H_2O$ (with a hydrocyanic acid yield of about 10% of theoretical). This and other experiments show the possibility of a biogenetic relation between hydrocyanic acid and methylamine, but at present there is no direct demonstration of this relation in the realm of plant physiology. A water solution of methylamine saturated with hydrogen sulphide, will react with sulphur or sodium thiosulphate at 200°C. in a sealed tube: $CH_3NH_2 + 3S = HCNS + 2H_2S$.

ESCHERICH, K. (61)

FUMIGATION WITH ZYKLON AGAINST ANOBIUM. Ztschr. Angew. Ent. 17: 193. 1930. [In German. Abstract in Rev. Appl. Ent. 19(A): 183. 1931.]

Fumigation of the altar of a church in Upper Austria with Zyklon B was carried out from November 4th to November 12th, 1929, with complete success. It is concluded that in a well-sealed building fumigation for 3 days with 2% by volume of hydrocyanic acid gas is sufficient.

FARBSALZ-GESELLSCHAFT M. B. H. (62)

PROCESS FOR FORCING PLANT GROWTH. German Patent 517,115, issued January 31, 1931; applied for November 25, 1928. [Abstract in Chem. Zentbl. 102 (II): 112. 1931.]

Comprises the use of a decomposable cyanide containing calcium carbide and ammonia (or a nitrogen compound which evolves ammonia). For example, one may use calcium cyanide which contains these materials. This process is claimed to greatly increase the well-known effect of hydrocyanic acid.

------- (63)

PROCESS FOR FUMIGATION WITH DECOMPOSABLE CYANIDES, ESPECIALLY CALCIUM CYANIDE. German Patent 522,316, issued April 7, 1931; applied for February 19, 1928. [Abstract in Chem. Zentbl. 102 (II): 761. 1931.]

The evolution of hydrogen sulphide from sulphides present as impurities is prevented by adding an oxidant such as lead monoxide, lead dioxide, or manganese dioxide. The effect of the oxidant is increased by adding a finely divided drying agent, especially calcium chloride or cupric sulphate.

FICK, R. (64)

HYDROCYANIC ACID. German Patent 476,662, issued August 26, 1929; applied for December 20, 1924. Assigned to I. G. Farbenindustrie A.-G. [In German. Abstract in Chem. Abs. 25: 562. 1931.]

Hydrocyanic acid is prepared by heating formaldehyde to above 400°C. for less than 1 sec. (1/10 sec. is mentioned). Water-separating, non-metallic catalyzers such as aluminum phosphate may be present, and the pressure reduced. Examples are given.

FICK, R. and NICOLAI, F. (65)

HYDROCYANIC ACID. German Patent 510,407, issued October 18, 1930; applied for May 1, 1923; addition to 485,989. Assigned to I. G. Farbenindustrie A.-G. [In German. Abstract in Chem. Abs. 25: 1040. 1931.]

The method of 485,989 for the production of hydrocyanic acid by passing formamide and ammonia over catalyzers at 400°C. is modified by using ammonium formate or a mixture of formamide and ammonium formate instead of formamide and ammonia. Formic acid may also be added.

FIELD, J., and FIELD, S. M. (66)

CYANIDE-STABLE RESPIRATION. Soc. Expt. Biol. and Med. Proc. 28: 995-996. 1931. Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

FINNEMORE, H., and COX, C. B. (67)

CYANOGENETIC GLUCOSIDES IN AUSTRALIAN PLANTS. II. (a) EREMOPHILA MACULATA. Jour. Proc. Roy. Soc. N.S. Wales 63: 172-178. 1930. [Abstract in Chem. Abs. 25: 2455. 1931.]

Prunasin (cyanogenetic glucoside) has been isolated from the bark of Prunus serotina, and its identity with the glucoside now isolated from Eremophila maculata has been confirmed by the mixed melting point method.

FLOREY, H. (68)

EFFECT OF CYANIDE ON MECHANISM OF GOBLET-CELL SECRETION IN MAMMAL. Brit. Jour. Expt. Path. 12: 301-305. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

FLOSDORF, E. W. (69)

POISONOUS CONSTITUENTS OF TOBACCO SMOKE. II. Catalyst 16: 70. 1931. [Abstract in Chem. Zentbl. 102 (II): 338. 1931.]

Nicotine, hydrocyanic acid, hydrogen sulfide, and carbon monoxide are present in tobacco smoke. Their absorption and elimination by the system are discussed.

FORNEAU, E., and MELVILLE, K. I. (70)

STUDIES OF MERCURY CHEMICO-THERAPY. I. THE TOXICITY OF MERCURY; ITS DETERMINATION, MECHANISM AND RELATION TO CHEMICAL CONSTITUTION. Jour. Pharmacol. Expt. Ther. 41: 21-45. 1931. [Paris]. [In French. Abstract in Chem. Zenthl. 102 (II): 80. 1931.]

Tests are described with 18 mercury compounds, including mercuric cyanide.

FOWWEATHER, F. S. (71)

A CASE OF CYANIDE POISONING BY SODIUM NITROPRUSSIDE. Brit. Med. Jour. 2: 344. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

FRANCK, H. H., and HEIMANN, H. (72)

THE PREPARATION OF PURE CALCIUM AND MAGNESIUM CYANAMIDES AND THE EQUILIBRIUM OF THE REACTIONS CaO (MgO) 2HCN = $CaCN_2$ ($MgCN_2$) CO H_2. Ztschr. Angew. Chem. 44: 372-378. 1931. [In German. Abstract in Chem. Abs. 25: 3924. 1931.]

Calcium oxide reacts with hydrocyanic acid at room temperature to give pure calcium cyanide. Above 400°C. calcium cyanamide begins to be formed, and at 600°C. it is formed to the exclusion of the cyanide. Equilibrium constants for calcium oxide reaction at 627°C., 727°C., 827°C., 897°C. are log K_p = -3.1, -2.5, -2.0, -1.8; for magnesium oxide at 627°C., 727°C., 827°C. log K_p = 0.5, 0.75, 0.9. The Nernst chemical constant for hydrocyanic acid is calculated as 3.5.

FRAPPA, C. (73)

INSECTS INJURIOUS TO THE COFFEE TREES OF MADAGASCAR. Agr. Prat. Pays Chauds 2: 245-257. 1931. [In French. Abstract in Rev. Appl. Ent. 19(A): 372. 1931.]

The Gryllid *Brachytrypes membranaceous* var. *colosseatus* Sauss., has been known in Madagascar for many years as a pest in the roots of coffee and *Albizzia lebbek*. To destroy it, calcium cyanide should be distributed through the underground galleries; small heaps of leaves may be used as shelter traps.

FREDENHAGEN, K. (74)

DENSITY, INNER FRICTION, DIELECTRIC CONSTANT, DIPOLE MOMENT, DISSOLVING POWER AND DISSOCIATING POWER OF HYDROCYANIC ACID. Trans. Elecktrochem. Soc. (preprint) 60: 11 pp. 1931. [In German. Abstract in Chem. Abs. 25: 5072. 1931.]

The researches of Kahlenberg and Schlundt are carefully analyzed; a number of their experiments are repeated and new ones added. Careful determinations are made of the dielectric constant and the dipole moment of pure distilled hydrocyanic acid. The density and internal friction of the acid are determined and the solubilities and conductivities of various salts in hydrocyanic acid are measured. The results in general check those of Kahlenberg and Schlundt and are also in accord with the author's researches with liquid ammonia and hydrofluoric acid as solvents.

FREDENHAGEN, K., and MASKE, F. (75)

THE DIELECTRIC CONSTANT OF GASEOUS HYDROGEN CYANIDE AND ITS DIPOLE MOMENT. Ztschr. Phys. Chem. 10 (B): 142-148. 1930 [In German. Abstract in Chem. Abs. 25: 241. 1931.]

The dielectric constant of vapor from liquid hydrocyanic acid held between 3° and 15°C. superheated to 30 - 200°C. was measured. The condenser was built within a glass tube, and the whole was inserted in an oven and submitted to high-frequency potential. The results are given graphically, and the dipole moment is calculated as 2.1 x 10^{-18} e.s.u.

PROBISHER, M., and SHANNON, R. C. (76)

THE EFFECTS OF CERTAIN POISONS UPON MOSQUITO LARVAE. Amer. Jour. Hyg. 13: 614-622. 1931. [Abstract in Rev. Appl. Ent. 19(B): 140. 1931.]

Potassium cyanide was relatively inert as compared with iodine and bromine. Even in a 1% solution the full grown larvae of A. argenteus were able to survive for nearly an hour, and they lived for about 10 min. in a 10% solution. (Potassium hydroxide was almost as effective at 10% concentration). Hydrocyanic acid gas killed within 10 min. when applied in an air chamber to larvae in a thin film of water. The gas probably gains entrance to the body more rapidly in adults, which are killed almost instantly.

FULTON, R. R. (77)

HYDROCYANIC ACID. Canadian Patent 311,301, issued May 12, 1931; applied for June 25, 1930; assigned to The Koppers Co. [Abstract in Chem. Abs. 25: 3443. 1931.]

Ammonia gas is bubbled through aqueous ammonia to form a mixture of ammonia gas and water vapor, the ammonia-water mixture is bubbled through a liquid containing one or more hydrocarbons to form a mixture of ammonia gas, water vapor, and hydrocarbon vapor, and the resultant mixture is passed through a catalytic material at 1100-1150° to form hydrocyanic acid.

GASSNER, L. (78)

HYDROCYANIC ACID AND THE GASEOUS INSECTICIDES. Ztschr. Gesell. Mühlenwesen 7: 128-130. 1930. [Abstract in Chem. Zentbl. 102 (I): 2105. 1931.]

A review.

GAY, H. H. (79)

COMPARISON OF EFFECTS OF LOW ALVEOLAR OXYGEN, OF SODIUM CYANIDE AND OF SODIUM SULFIDE UPON RESPIRATORY MOVEMENTS AND RESPONSE OF MUSCLE TO DIRECT, INDIRECT AND REFLEX STIMULATION. Amer. Jour. Physiol. 95; 519-526. 1930. [Abstract in Chem. Zentbl. 102 (I): 3699. 1931.]

GERBIS, H. (80)

A FATAL CASE OF HYDROCYANIC ACID POISONING. Samml. Vergiftungsfällen 2: Vergiftungsfällen 35-36. Beilage zu Arch. Expt. Path. u. Pharmakol. 1931. [Abstract in Chem. Zentbl. 102 (I): 3024. 1931.]

Report concerning the death of a 22-year-old laboratory worker who was handling a 5% potassium cyanide solution. Apparently he had poured the potassium cyanide solution into an open drain in which had collected some acid, and had then inhaled the hydrocyanic acid thus produced.

GERWE, E. G. (81)

STUDIES ON THE SPONTANEOUS OXIDATION OF CYSTEINE. II, III. THE METHOD OF ACTION OF CYANIDES AND CYSTINE ON CYSTEINE OXIDATION. Jour. Biol. Chem. 92: 399-411, 525-533. 1931. [Abstracts in Chem. Abs. 25: 5441. 1931. Exp. Sta. Record 67:196. 1932.]

The slow autoxidation of iron-free cysteine is not inhibited by potassium cyanide. If iron be added to pure cysteine the accelerated oxidation which it produces is reduced again by cyanides to the original low value. Iron as ferro- or ferri-cyanide has no accelerating effect on the oxidation. The addition of pure cystine to iron-free cysteine is also without effect, contrary to the findings of Dixon and Tunnicliffe.

GESELLSCHAFT FÜR KOHLENTECHNIK M. B. H. (82)

HYDROCYANIC ACID AND CYANIDES. German Patent 509,935, issued October 14, 1930; applied for June 8, 1929. [In German. Abstract in Chem. Abs. 25: 779. 1931.]

Ammonium thiocyanate dye obtained from the working up of the distillation gases of bituminous fuel is oxidixed by nitric acid and neutralized by ammonium hydroxide to produce hydrocyanic acid and an oxidized residue useful as a fertilizer. The hydrocyanic acid can be worked up into cyanides. The nitric acid may be replaced by the nitrogen oxides obtained by burning ammonia for the preparation of nitric acid.

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PREPARATION OF HYDROCYANIC ACID. German Patent 530,821, issued August 1, 1931, applied for July 16, 1929; addition to 528,968. [Abstract in Chem. Zentbl. 102 (II): 3393. 1931.]

In preparing hydrocyanic acid from ammonium thiocyanate and nitric acid: (1) Before oxidizing ammonium thiocyanate with nitric acid or nitrous gases, it should be converted to thiocyanic acid by acidifying with another acid (sulphuric acid) and then separated from the ammonium salt. (2) While still in the gaseous state (alone or in mixture with other gases) the thiocyanic acid is brought into contact with nitric acid, nitric acid vapors, or with nitrous acid or nitrous gases.

GLUUD, W. (84)

PREPARATION OF FERROCYANIDE SALTS FROM CYANIDE SOLUTIONS, AND ITS CONVERSION TO FERRICYANIDE BY TREATMENT WITH COMPRESSED OXYGEN, WITH A FINAL ELECTROLYTIC OXIDATION. Ber. Gesell. Kohlentech. (Dortmund-Ewing) 3: 385-394. 1931. [Abstract in Chem. Zentbl. 102 (II): 1519. 1931.]

Hydrocyanic acid is first reacted with calcium hydroxide to form calcium cyanide. Ferrous sulfate is then added, in weak alkaline solution, to produce calcium ferrocyanide. The calcium ferrocyanide solution is freed from calcium sulphate, then treated with potassium carbonate, to yield $K_4Fe(CN)_6 + CaCO_3$. After filtering off the calcium carbonate the solution is concentrated and $K_4Fe(CN)_6$ crystallized out. To oxidize $Ca2Fe(CN)_6$ to $Ca_3 [Fe(CN)_6]2$, a 20% solution of $Ca_2Fe(CN)_6$. 12 H_2O is agitated at 100°C in an autoclave with carbon dioxide and oxygen at about 5 atmospheres' pressure. The final 5% must be oxidized electrolytically.

------- and DIECKMANN, C. (85)

HYDROCYANIC ACID. German Patent 526,716 issued June 10, 1931; applied for February 7, 1930; assigned to Gesellschaft für Kohlentech. M. B. H. [In German. Abstract in Chem. Abs. 25: 4808. 1931.]

Thiocyanic acid is subjected to a luminous electrical discharge of suitable frequency. Examples are given.

------- and DIECKMANN, C. (86)

THE EFFECT OF ELECTRICAL DISCHARGES UPON THIOCYANIC ACID. Ber. Gesell. Kohlentech. 3: 420-428. 1931. [In German. Abstract in Chem. Abs. 25: 2647. 1931.]

The effect of electrical discharges upon the reaction: HCNS(aq.)-HCN(aq.) S(rhombic) was studied, both silent and glow discharges being used. With the silent discharge, the yields were too low and the energy consumption extremely high. With the glow discharge, however, and with addition of hydrogen gas, about 80% of the thiocyanic acid was decomposed, 95-100% of which was recovered as hydrocyanic acid. Varying quantities of sulphur dioxide, hydrogen sulphide or sulphur are also obtained, depending upon the experimental conditions. Electrical efficiency is very low, the energy consumption being about 675 watt hours per mole of hydrocyanic acid compared with a theoretical requirement of only 6.87 watt hours.

------- and KELLER, K. (87)

PREPARATION OF HYDROCYANIC ACID BY OXIDATION OF AMMONIUM THIOCYANATE OR THIOCYANIC ACID WITH NITRIC ACID. Ber. Gesell. Kohlentech. 3: 395-419. 1931. [In German. Abstract in Chem. Abs. 25: 2382. 1931.]

In the oxidation of ammonium thiocyanate with nitric acid, to get a good yield of hydrocyanic acid it is necessary to count on a 10% loss of ammonia and nitric oxide, because of the fact that nitrous acid is formed, which in turn forms ammonium nitrite, and this is decomposed into nitrogen and water. If ammonium thiocyanate, however, is first converted into thiocyanic acid by treatment with sulphuric acid, oxidation of the free acid to hydrocyanic acid can be brought about without this loss of nitrogen. The reaction proceeds according to the equation: $HCNS + 2HNO_3 = HCN + H_2SO_4 + 2NO$. A study of the most favorable conditions of concentration showed that if a solution of thiocyanic acid containing about 40 g. per 100 cc. is treated with nitric acid solution containing about 40 g. per 100 cc., a 95% yield of hydrocyanic acid can be obtained with very little loss of nitric oxide or nitric acid. This represents 3-4 moles of nitric acid per mole of thiocyanic acid, or a 100% excess of nitric acid. Experiments were made on a larger scale with the following results: To manufacture 1,000 kg. of hydrocyanic acid from 17% thiocyanic acid solution, 14,350 kg. of the thiocyanic acid solution, 13,950 kg. of nitric acid (52.8%), 8.4 cu.m. of reaction water, 43.8 cu.m. of cooling water and 10 kw. hrs. of electrical energy were required. This yielded, in addition to the hydrocyanic acid, 2,300 kg. of nitric oxide gas and 3,820 kg. sulphuric acid.

-------- KLEMPT, W., KELLER, K., BRODKORB, F., and DIECKMANN. C. (88)

CONVERSION OF CYANIDE SOLUTION INTO POTASSIUM FERROCYANIDE AND THE OXIDATION OF THE LATTER TO FERRICYANIDE BY COMPRESSED AIR AND ELECTROLYSIS. Ber. Gesell. Kohlentech. 3: 385-394. 1931. [In German. Abstract in Brit. Chem. Abs. 1931 (B): 586. 1931.]

The problem investigated was the utilization of hydrogen cyanide present in a gas in large quantities. This compound was first converted into calcium cyanide, then into the ferrocyanide. The [potassium] ferrocyanide solution (20% solution) was first oxidized under 20-50 atm. pressure with a mixture of oxygen and carbon dioxide (at 100°C.), and the oxidation then completed by electrolysis.

-------- and RIESE, W. (89)

USE OF NICKEL- AND COPPER-SALT SOLUTIONS FOR REMOVAL OF HYDROCYANIC ACID FROM COKE-OVEN GASES. Ber. Gesell. Kohlentech. (Dortmund-Ewing) 3: 437-452. 1931. [Abstract in Chem. Zentbl. 102 (II): 1518. 1931.]

In the presence of ammonia, nickel sulphide will react with cyanide as follows:

$$NiS + 2NH_4CN = (NH_4)_2S + Ni(CN)_2$$
$$Ni(CN)_2 + 2NH_4CN = (NH_4)_2Ni(CN)_4$$

The final complex cyanide dows not yield a precipitate with hydrogen sulphide, nor will carbon dioxide liberate hydrocyanic acid from it. In the presence of ammonia, however, some thiocyanate is formed by the action of the ammonia on the nickel-complex. This can be largely prevented by working in the presence of sodium carbonate or potassium carbonate, and excluding air. In removing hydrocyanic acid from coke-oven gas, therefore, the ammonia is removed before the gas comes in contact with the nickel solution. The sodium nickel cyanide or potassium nickel cyanide is easily separated by crystallization, but the subsequent liberation of hydrocyanic acid requires the use of concentrated acids, which as yet prevents technical application of the process. The copper salts behave quite similarly except for a lesser stability towards carbon dioxide.

------- and RIESE, W. (90)

THE COMPLEX CYANIDES OF NICKEL, COPPER AND CHROMIUM. Ber. Gesell. Kohlentech. (Dortmund-Ewing) 3: 452-459. 1931. [Abstract in Chem. Zentbl. 102 (II): 1519. 1931.]

Description of an investigation of the behavior of the complex cyanides of iron, nickel, copper, and chromium toward silver nitrate, ammonium sulphide, and ferrous sulphate.

GOLSE, J. (91)

DETERMINATION OF CYANIDE IN FERRO-AND FERRI- CYANIDES. Bull. Soc. Pharmacol. Bordeaux 67: 217-221. 1929. [In French. Abstract in Chem. Abs. 1931: 5872. 1931.]

In Rose and Finkener's method the solution of 0.5 g. of salt in 20 cc. of water is preferably boiled for 10 min. with 15 cc. of normal sodium hydroxide and 40 cc. of 5% mercuric chloride solution, the cyanide being titrated in an aliquot part of the filtrate.

GRAY, G. P., and KIRKPATRICK, A. F. (92)

THE DIFFUSION OF HYDROCYANIC ACID GAS. Calif. Dept. Agr. Monthly Bull. 20: 373-382. [Abstract in Rev. Appl. Ent. 19(A): 616. 1931.]

The importance of even distribution of gas in the fumigation of Citrus trees with hydrocyanic acid is briefly discussed from the literature. Recent results of research in the control of resistant strains of coccids (Saissetia oleae Bern. and Chrysomphalus aurantii Mask.) are recapitulated.

GUERIN, P. (93)

HYDROCYANIC ACID IN LEGUMES. Bull. Soc. Chim. Biol. 12: 1338-1354. 1930. [In French. Abstract in Chem. Abs. 25: 3690. 1931.]

The Leguminaceae resemble the Rosacae in their frequent content of glucosides which give rise to hydrocyanic acid. Such glucosides occur only in the seeds of the Picea. In the lotus they do not occur in the seeds but appear during germination and occur generally in the cotyledons, stems, flowers, and roots. Tetragonolobus dorycnium and Bonjeania contain practically none in the seeds except during germination and only small amounts in the young plants. Phaseolus lunatus L. contains the glucosides in stems, roots, and seeds.

HAMBURGER GASWERKE G. M. B. H. (94)

PRODUCTION OF YELLOW POTASH OR YELLOW SODA IN THE REMOVAL OF CYANIDE FROM COAL GAS. French Patent 692,868, issued November 12, 1930; applied for March 28, 1930. [In French. Abstract in Chem. Zentbl. 102 (I): 562. 1931.]

The gases are washed in the usual way with an alkaline suspension of bivalent iron, with excess alkali, With gases containing carbon dioxide, counter-current washing is imployed. The alkali content of the wash liquor is adjusted in accordance with the hydrocyanic acid content of the gas, so that only soluble ferro-cyanide is formed.

HANES, C. S., and BARKER, J. (95)

PHYSIOLOGICAL ACTION OF CYANIDE. 1. EFFECTS OF CYANIDE ON THE RESPIRATION AND SUGAR CONTENT OF THE POTATO AT 15°. Proc. Roy. Soc. (London) Ser. B. 108: 95-118. 1931. [Abstract in Chem. Abs. 25: 4299. 1931.]

The respiration of potato tubers at a temperature of 15°C. increases in an atmosphere containing a low concentration of hydrocyanic acid. The respiratory rate first rises to a maximum, then undergoes a slower decrease. Moderate treatment with hydrocyanic acid does not influence the respiratory quotient, and its effects are reversible; in severe treatment, the respiratory quotient increases at the onset of the second phase, and irreversible injury occurs. The sugar content increases during the first phase, and, in moderate concentrations of hydrocyanic acid, decreases during the second phase. The respiratory enzymes are inactivated by a high concentration, but not by a moderate concentration of hydrocyanic acid.

HARGREAVES, E. (96)

ANNUAL REPORT OF THE ENTOMOLOGICAL SECTION FOR THE YEAR 1929. Ann. Rpt. Dept. Sierra Leone 1929: 16-18. [Abstract in Rev. Appl. Ent. 19(A): 115. 1931.]

Infestation of oil palm fruit by coccids has increased considerably during the last few years, and it is considered that they seriously affect the quality of the pericarp oil.

Harvest records indicate that dusting with calcium cyanide gave partial control, since seven treated palms yielded 47 fruit heads, of which only four were infested. The average infestation for the whole plantation was about 20%.

HEERDT-LINGLER GESELLSCHAFT (97)

STORING HYDROCYANIC ACID. British Patent 339,717, issued December 18, 1930; applied for October 8, 1929; in Germany October 22, 1928. [Abstracts in Chem. Abs. 25: 2817. 1931. Brit. Chem. Abs. 1931(B): 246. 1931.]

Hydrocyanic acid (alone or absorbed in porous or granular substances) is packed in closed metal containers from which the atmospheric oxygen is expelled by boiling the hydrocyanic acid, by generation of an inert gas such as nitrogen or carbon dioxide in the container, or by pumping.

------- (98)

PEST-DESTROYING AGENTS. German Patent 516,594, issued January 24, 1931; applied for February 14, 1928. [In German. Abstract in Chem. Abs. 25: 2825. 1931.]

The agent depends for its action on the evolution of hydrocyanic acid from alkaline earth cyanides when exposed to air. The alkaline earth cyanides are powdered, optionally mixed with irritants and odorants, and pressed into briquets, etc., with binding material. Thus, calcium cyanide is mixed with nicotine sulphate and briquetted.

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HYDROCYANIC ACID. German Patent 529,877, issued July 18, 1931; applied for October 23, 1928. [In German. Abstract in Chem. Abs. 25: 5253. 1931.]

Cans for storing and transporting liquid hydrocyanic acid last longer if charged with hydrocyanic acid in an oxygen-free atmosphere.

HEITLER, W., and RUMER, G. (100)

QUANTUM CHEMISTRY OF POLYATOMIC MOLECULES. Nachr. Gesell. Wiss. Göttingen, Math. u. Physik. Klasse 1930: 277-284. [In German. Abstract in Chem. Abs. 25: 4789. 1931.]

The general theory of valence is extended to polyatomic molecules by the Born,-Bloch,-Slater method. The general case of a molecule containing univalent and n-valent atoms is discussed. For hydrocyanic acid, two forms can exist having the structures $H-C\equiv N$ and $H-N=C$.

------- (101)

QUANTUM THEORY OF CHEMICAL BINDING IN POLYATOMIC MOLECULES. Ztschr. Physik 68: 12-41. 1931. [Abstract in Chem. Abs. 25: 4777. 1931

Heitler and London's theory of chemical binding in diatomic molecules is extended to polyatomic molecules. Examples discussed include hydrocyanic acid which theory predicts as $H-C\equiv N$, cyanic acid, $C=C=N-H$, and cyanogen, $CN-CN$.

HERRDEGEN, K., and LIESEBERG, F. (102)

HYDROCYANIC ACID. German Patent 526,767, issued June 10, 1931; applied for December 17, 1927; assigned to I. G. Farbenindustrie A.-G. [In German. Abstract in Chem. Abs. 25: 4980. 1931.]

Hydrocyanic acid is prepared by treating alkali cyanide with sodium bicarbonate in the presence of water. The sodium bicarbonate is present in excess and the generated hydrocyanic acid is removed from the warm reaction mass by reducing the pressure.
Examples are given.

HEYMANS, C., BOUCKAERT, J. J., and DAUTREBANDE, L. (103)

CAROTID SINUS AND RESPIRATORY REACTIONS BY CYANIDE. Compt. Rend. Soc. Biol. 106: 54-55. 1931. [In French. Abstract in Chem. Abs. 25: 2202. 1931.]

A series of experiments with dogs in which the cyanide was caused to act solely on the carotid sinus and then solely on the centers. The results show that the inhibitory action of cyanide on respiration is due to the sensitivity of the carotid sinus to cyanide, and not due to the action of the cyanide on the centers.

------- (104)

THE SENSITIVITY OF THE CAROTID SINUS WITH RESPECT TO THE HEART REFLEXES TOWARD CHEMICAL SUBSTANCES; NICOTINE, LOBELIN, CYANIDES AND SULFIDES. Compt. Rend. Soc. Biol. 106: 1276-1279. 1931. [In French. Abstract in Chem. Zentbl. 102 (II) 2351. 1931.]

HEYMANS, J. F. (105)

DISINFECTION BY HYDROGEN PEROXIDE PLUS HYDROCYANIC ACID AS ANTICATALYST. Arch. Internatl. Pharmacodyn. et Ther. 37: 196-198. 1930. [In French. Abstracts in Physiol. Abs. 15: 616-617; Chem Abs. 25: 3726. 1931]

The mixture of hydrogen peroxide and potassium cyanide (3 or 15% hydrogen peroxide to an equal amount of 2% solution of potassium cyanide) applied in a suitable manner to infectious areas of the skin, or of mucuous membranes or wounds, removes completely the infection. Painting of the site of inoculation of vaccine on cows with this mixture completely checked all development of vaccinal eruption. It is believed that in man the eruption of small-pox might be annulled by the mixture and the evolution of infection modified.

HICKS, J. F. G. (106)

THE ROLE OF HYDROCYANIC ACID VAPORS IN THE CORROSION OF IRON. Jour. Phys. hem. 35: 893-904. 1931. [Abstract in Chem. Abs. 25: 2961. 1931.]

Investigations were made to determine the part played by hydrocyanic acid gas in the corrosion of iron, particularly in the internal corrosion of gas mains. From graphs of the corrosive effects (mg./sq.cm.) of various gaseous mixtures against the time of test (days), it is concluded that: (1) hydrocyanic acid, although not a cause, is the chief contributory factor in the internal corrosion of gas mains, carbonic acid and oxygen following in order, and (2) hydrocyanic acid possesses the greatest intensity of effect and is first in order of priority of attack. It is shown that in the cases studied hydrocyanic acid does not initiate the corrosion. The mechanism of the "cyanide corrosion" of iron is similar to other iron-corrosion processes. Prussian blue is the final product in the corrosion of iron in the interior of gas mains. The conclusions drawn from the graph are checked electrochemically.

HILL, E. S. (107)

EFFECT OF IRON AND CYANIDES ON THE SPONTANEOUS OXIDATION OF DIALURIC ACID. Jour. Biol. Chem. 92: 471-481. 1931. [Abstract in Brit. Chem. Abs. 1931(A): 1246. 1931.]

The spontaneous oxidation of dialuric acid is greatly accelerated by addition of iron, except at the normal optimum range of pH 7.0-7.4 owing, perhaps, to the inability of oxygen to enter the solution at a rate greater than normal. Autoxidation of the acid is not inhibited by potassium cyanide, whereas the acceleration due to the presence of iron is inhibited. Comparison is made with cysteine and glutathione in cell oxidation.

HOSODA, N. (108)

INSULIN AND THE SIMULTANEOUS USE OF HYDROCYANIC ACID. Jour. Biochem., Tokyo. 10: 383. 1929. [Abstract in Physiol. Abs. 15: 381. 1930-1931.]

Since the hyperglycaemia produced in rabbits by potassium cyanide injection is converted to a normal or a hypoglycaemic condition by insulin, the author suggests that insulin cannot be the activator for the formation of hexose diphosphate.

HOUGHTON, H. W. (109)

FUMIGANT. Canadian Patent 280,056, issued March 8, 1929; applied for August 10, 1925; assigned to Safety Fumigant Co. [Abstract in Chem. Zentbl. 102 (I): 140. 1931.]

Cyanogen chloride is evolved from aqueous cyanide solution by the action of nascent chlorine, using therefor a chlorate mixed with a silicon compound. Talc is suitable.

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FUMIGANT. Canadian Patent 280,057 issued May 8, 1928; applied for February 27, 1928; assigned to Safety Fumigant Co. [Abstract in Chem. Zentbl. 102 (I): 140. 1931.]

Cyanogen chloride is evolved from aqueous cyanide solution by the action of nascent chlorine.

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FUMIGANT IN SOLUTION. United States Patent 1,790,095, issued January 27, 1931; applied for July 1, 1925; assigned to Safety Fumigant Co. [Abstracts in Chem. Zentbl. 102 (II): 1184. 1931. Brit. Chem. Abs 1931(B): 864. 1931.]

A poisonous gas (hydrocyanic acid) and a tear gas (cyanogen chloride) are dissolved in water containing about 25% of a carbohydrate (glucose, alcohol, glycerine) and about 10% of acetone. The gases are thereby stabilized and the fumigation can be controlled.

------- (112)

COMPOSITION FOR FUMIGATING WITH HYDROCYANIC ACID. United States Patent 1,818,136, issued August 11, 1931; applied for March 5, 1928; assigned to Safety Fumigant Co. [Abstract in Chem. Abs. 25: 5501. 1931.]

A composition for the simultaneous generation of hydrocyanic acid, cyanogen chloride, and another cyanogen halide such as cyanogen bromide or cyanogen iodide by the action of dilute hydrochloric acid comproses an inert material such as plaster or cement mixed with an alkali metal chlorate, an alkali metal cyanide and an alkali metal halide such as sodium bromide or sodium iodide.

I. G. FARBENINDUSTRIE A.-G. (113)

REMOVAL OF AMMONIA, HYDROGEN SULFIDE AND HYDROGEN CYANIDE FROM COAL GAS. French Patent 666,131, issued Sept. 27,1929; applied for December 20, 1928; in Germany December 21, 1927. [In French. Abstract in Chem. Zentbl. 102 (I): 195. 1931.]

The gas, with the addition of sufficient ammonia to combine with the hydrogen sulphide and hydrocyanic acid, is washed with ammonium polysulphide and ammonium thiosulphate. After separation of sulphur, ammonium sulphate and ammonium thiocyanate are obtained by fractional vaporization.

-------- (114)

SPRAY METHOD FOR CONTROL OF INSECT PESTS ON PLANTS. German Patent 529,575, issued July 15, 1931; applied for March 6, 1928. [Abstract in Chem. Zentbl 102 (II): 1910. 1931]

Consists of an aqueous solution of calcium cyanide, magnesium cyanide, or their double compounds with ammonia. For example, 15 parts calcium cyanide are dissolved in 85 parts cold water; or, 98 parts sodium cyanide and 100 parts calcium chloride are dissolved in about 400 parts water.

------- (115)

COMPOUND CONTAINING MAGNESIUM CYANIDE AND AMMONIA. Swiss Patent 141,748, issued October 16, 1930; applied for February 20, 1929; in Germany March 19, 1928. [Abstract in Chem. Zentbl. 102 (I): 1507. 1931.]

A magnesium compound, such as magnesium hydroxide, is treated with hydrocyanic acid and ammonia in the presence of an alcohol (methyl alcohol, ethyl alcohol, etc.). Excess water must be avoided.

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CALCIUM CYANIDE. Swiss Patent 142,733, issued December 16, 1930; applied for January 23, 1929; in Germany February 13, 1928. [Abstract in Chem. Zentbl. 102 (I): 2384. 1931.]

Hydrocyanic acid, diluted with indifferent gases such as nitrogen, hydrogen, air, or ammonia, is allowed to react with calcium hydroxide at temperatures below 100°C., under conditions such that the water produced by the reaction is quickly removed. A stable product is obtained which contains more than 50% calcium cyanide.

IMAGAWA, S. (117)

SWELLING EFFECT OF GLUCOSE ON KIDNEYS. Proc. Imp. Acad. Tokyo 6: 383-384. 1930. [Abstract in Chem. Zentbl. 102 (I): 1939. 1931.]

Such an effect is indicated by experiments on animal kidneys with phlorizin, mercuric chloride, and potassium cyanide.

IMPERIAL CHEMICAL INDUSTRIES, LTD. (118)

HYDROCYANIC ACID. French Patent 692,543, issued November 6, 1930; applied for March 21, 1930; in England March 27, 1929. [In French. Abstract in Chem. Abs. 25: 1642. 1931.]

Hydrocyanic acid is produced as described in French Patent 692,542, but the ammonia is not used in excess. Instead an appreciable amount of a diluent such as hydrogen or nitrogen is used. The hydrocarbon may be coke-furnace gas, and it may be purified and at the same time mixed with ammonia by bringing it into contact with liquid ammonia.

IMPERIAL CHEMICAL INDUSTRIES, LTD., WHEELER, T. S., and FLETCHER, W. B. (119)

APPARATUS FOR GAS REACTIONS AT HIGH TEMPERATURE. British Patent 349,958, issued May 27, 1931; applied for January 27, 1930. [Abstract in Chem. Zentbl. 102 (II): 1463. 1931.]

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The apparatus is suitable for the preparation of hydrocyanic acid from ammonia and hydrocarbons, or for the cracking of hydrocarbons.

IMPERIAL CHEMICAL INDUSTRIES, LTD., WHEELER, T. S., and FRANCIS, W. (120)

HALOGEN CYANIDES. British Patent 347,989, issued May 7, 1931; applied for August 15, 1930; in United States August 16, 1929. [Abstracts in Chem. Zentbl. 102 (II): 1924. 1931. Brit. Chem. Abs. 1931 (B): 632. 1931.]

Hydrocyanic acid (in 4% aqueous solution) is treated in a pressure vessel equipped with cooling and stirring apparatus with somewhat less than an equivalent amount of the halogen. The reaction occurs at a pressure of 20-30 lbs./sq. in. and a temperature of 20-30°C.

IMPERIAL CHEMICAL INDUSTRIES, LTD., WHEELER, T. S., McAULAY, J., FLETCHER, W. B., and MILLS, H.A.T. (121)

HYDROCYANIC ACID. British Patent 335,585; issued September 29, 1930; applied for March 27, 1929, April 20, 1929, April 23, 1929, and December 24, 1929. French Patent 692,542 issued November 6, 1920; applied for March 21, 1930; in England March 27, 1929. [Abstract in Chem. Abs. 25: 1642. 1931.]

Reaction between a hydrocarbon gas (such as methane, ethane, and various natural and artificial industrial gases containing hydrocarbons) and ammonia, to produce hydrocyanic acid and hydrogen is effected by passing a mixture of the hydrocarbon material with more than one molecular proportion of ammonia for each atomic proportion of carbon, at a temperature of at least 1150°, rapidly through an unpacked reaction chamber. Hydrogen or water vapor may be present, the gas mixture may be preheated to 900° or higher, and the reaction chamber is preferably formed with smooth internal surfaces such as glazed silica or sillimanite. Sulphur compounds and carbon dioxide may be removed from the gases by passing them through aqueous or liquid ammonia.

IMPERIAL CHEMICAL INDUSTRIES, LTD., WHEELER, T. S., MILLS, H.A.T., FLETCHER, W. B., and McAULAY, J. (122)

PREPARATION OF HYDROCYANIC ACID. British Patent 353,407, issued July 21, 1931; applied for February 21, 1930; addition to 335,947. [Abstracts in Chem. Zentbl. 102 (II): 3041. 1931. Brit. Chem. Abs. 1931 (B): 924. 1931.]

Nitrogen is used instead of hydrogen as a diluent, at a temperature of about 1150°C. A mixture of hydrogen and nitrogen may also be used.

IMPERIAL CHEMICAL INDUSTRIES, LTD., WHEELER, T. S., MILLS, H.A.T., McAULAY, J., and FLETCHER, W. B. (123)

HYDROCYANIC ACID. British Patent 335,947, issued September 29, 1930; applied for March 27, 1929, April 20, 1929 and December 24, 1929 [Abstract in Chem. Abs. 25: 1953. 1931.]

In preparing hydrocyanic acid by reaction between hydrocarbon gas and ammonia as described in British Patent 335,585, the reaction mixture may contain one molecular proportion of ammonia to one atomoc proportion of carbon, or less, if the mixture also contains hydrogen.

ISACHENKO, V. B., and BONDARTŽEV, A. S. (124)

CALCIUM CYANIDE AS A MEANS OF CONTROLLING COCCIDS AND THRIPS IN GREEN HOUSES. Norbi Plantarum 18: 177-187. 1929 [In Russian. Abstract in Rev. Appl. Ent. 19(A): 227. 1931.]

An account of a large number of experiments with 150 varieties of ornamental greenhouse plants.

JABLCZYNSKI, K., and MACZKOWSKA, J. (125)

THE POISONING OF REACTIONS IN HETEROGENEOUS SYSTEMS. Ztschr. Anorg. Allgem. Chem. 197: 292-300. 1931. Roczniki Chem. 11: 139-152 (German 152-153). 1931 [In German. Abstract in Chem. Abs. 25: 3551. 1931.]

In the reactions studied at 25°C. the effect of the poison increased with increase in concentration up to a certain concentration, above which the effect was constant. The solvent used in each case was 0.1 normal hydrochloric acid. Hydrocyanic acid (0.002 N) and arsenious exide (0.005 N) decrease the velocity constant for the solution of marble 30% and 12%, respectively. Hydrocyanic acid, arsenious oxide and hydrogen sulphide (0.005 N) decrease the velocity constant for the solution of magnesium 12, 9 and 22% respectively. Hydrc cyanic acid (0.01 N) decreases the velocity constant for technical zinc by 67%, while arsenious oxide (0.005 N), hydrogen sulphide (0.004 N), and iodine in potassium iodide (0.003 N) increase the constant 33, 19, and 76%. Potassium iodide and formaldehyde have no effect on the rate of solution of zinc.

JAEGER, A. O. (126)

APPARATUS FOR EXPTHERMIC CATALYTIC GAS REACTIONS. British Patent 331,468, issued July 3, 1930; applied for November 4, 1929; in United States December 22, 1928. [Abstract in Chem. Abs. 25: 177. 1931.]

An apparatus is described which is suitable for the production of sulphur trioxide and which also may be used in organic oxidations, ammonia purification, reductions, hydrogenations, condensations, the water-gas process, or hydrocyanic acid synthesis.

JOHNSON, J. Y. (127)

MANUFACTURE OF AGENTS FOR COMBATING AND DESTROYING PESTS. British Patent 322,179, issued November 27, 1929; applied for August 27, 1928; assigned to I. G. Farbenindustrie A.-G. [Abstract in Brit. Chem. Abs. 1931 (B): 168. 1931.]

The agents comprise cyanides readily decomposed by moisture (alkaline-earth or magnesium cyanides) together with non-reacting organic liquids (petroleum fractions, halogenated hydrocarbons, etc.) and, if desired, wetting agents and (or) hygroscopic salts.

KAISER, M., and FRIED, E (128)

FUMIGATION WITH HYDROCYANIC ACID (ZYKLON B). Ztschr. Desinfektion 23:4-11. 1931. [Abstract in Chem. Zentbl. 102 (I): 1811. 1931]

Hydrocyanic acid, in the form of Zyklon B, proved itself excellent for killing insects infesting wood. The hydrocyanic acid concentration was 3-7 g. per cu. m., during a period of 7 days.

KARL, A. (129)

FUMIGATING ROOMS WITH HYDROCYANIC ACID. French Patent 691,250, issued October 2, 1930; applied for March 6, 1930. [In French. Abstract in Chem. Zentbl. 102 (I): 2901. 1931.]

The room is first treated with an irritating or suffocating gas, in order to warn any persons who might be present. Then the room is fumigated with hydrocyanic acid containing another irritant which also serves to stabilize the hycrocyanic acid. After ventilation, the room is treated with a gas which destroys the toxicity of hydrocyanic acid. For example, a solution of 6-10 g. acrolein per liter of water is atomized into the room, followed by hydrocyanic acid containing 28.5% of sulphur dioxide. Finally, the poisonous gases are neutralized by acetone.

KAUTSKY, H., and HIRSCH, A. (130)

ENERGY CHANGES AT BOUNDARY SURFACES. I. CARBONIC ACID REDUCTION BY INDUCED, INTRAMOLECULAR REARRANGEMENT OF SILICIC ACID DERIVATIVES. Ber. Dtsch. Chem. Ges. 64: 1610-1622. 1931. [Abstract in Chem. Zentbl. 102 (II): 1532. 1931.]

The authors attempt to reduce carbonic acid, adsorbed on a surface of a complex silicon compound, by oxidation or irradiation. It was shown that the carbonic acid was combined in the following manner: -- Si-O-CO-NH_2. By long continued additions of small amounts of oxygen to the system at room temperature, the carbonic acid was in fact reduced to some extent, yielding hydrocyanic acid and ammonia.

KEESER, F. (131)

IRON CONTENT AND RESISTANCE OF THE ORGANISM TO HYDROCYANIC ACID AND HYDROGEN SULFIDE. Arch Exptl. Path. u. Pharmakol. 156: 340-345. 1930. [In German. Abstract in Chem. Abs. 25: 4047. 1931.]

Of rabbits on (1) a milk-rice diet, (2) a green vegetable diet and (3) a green vegetable diet supplemented by iron chloride, the resistance to peroral sodium cyanide or subcutaneous sodium sulphide increases in the order named, presumably due to the greater iron content of the organs.

KELLER, K. (132)

REMOVAL OF HYDROGEN SULPHIDE AND HYDROCYANIC ACID FROM CRUDE BENZENE. Ber. Gesell. Kohlentech. 3: 429-436. 1931. [In German. Abstract in Chem. Abs. 25: 2269. 1931.]

In the presence of air and small quantities of ammonia, hydrogen sulphide is readily removed from crude benzene by conversion to ammonium sulphide and subsequent oxidation to ammonium thio sulphate. A small amount of water is necessary. Hydrocyanic acid is removed simultaneously with hydrogen sulphide by conversion to ammonium thiocyanate.

------- and GLUUD, W. (133)

HYDROCYANIC ACID. German Patent 528,968, issued July 7, 1931; applied for June 7, 1929. Assigned to Gesellschaft für Kohlentechnik M. B. H. [In German. Abstract in Chem. Abs. 25: 5253. 1931.]

Hydrocyanic acid is prepared by oxidizing ammonium thiocyanate with nitric acid, the concentration of free nitric acid in the mixture not being allowed to fall below 1%. Examples are given.

KERSCHBAUM, F. (134)

STABILIZATION OF HYDROCYANIC ACID. Canadian Patent 276,019, issued December 6, 1927; applied for May 27, 1925. [In French. Abstract in Chem. Zentbl. 102 (I): 1507. 1931.]

KILBOURNE, K. A. (135)

APPARATUS FOR FUMIGATING ENCLOSED SPACES WITH HYDROCYANIC ACID. United States Patent 1,809,279, issued June 9, 1931; applied for October 3, 1924; assigned to Owl Fumigating Corporation. [Abstract in Chem. Abs. 25: 4155. 1931.]

Structural features.

KOYASAKO, T. (136)

THE INFLUENCE OF POTASSIUM CYANIDE POISONING ON THE GLYCOGEN CONTENT OF THE LIVER AND THE MUSCLES. THE RELATION OF POTASSIUM CYANIDE POISONING TO THE EFFECT OF INSULIN. Folia Endocrinol. Japon. 6: 117-118. 1931. [Abstract in Chem. Zentbl. 102 (I): 2894. 1931.]

Single or repeated subcutaneous injections of 1% potassium cyanide solution, in rabbits, causes a decrease of liver glycogen and, to a small degree, in muscle glycogen. With simultaneous injection of insulin the decrease of glycogen is checked.

KUDO, F. (137)

BIOCHEMICAL STUDIES OF HYDROCYANIC ACID; INFLUENCE UPON CARBOHYDRATE METABOLISM. Jour. Oriental Med. 13: 38. 1930. [Cited in Quart. Cumulative Index Medicus 9: 337. 1931.]

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BIOCHEMICAL STUDIES OF HYDROCYANIC ACID; INFLUENCE UPON BLOOD CATALASE. Jour. Oriental Med. 14: 1. 1931. [Cited in Quart. Cumulative Index Medicus 9: 337. 1931.]

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EFFECTS OF HYDROCYANIC ACID INTOXICATION UPON PHYSICOCHEMICAL CHEMICAL CHARACTERISTICS OF BLOOD AND SERUM. Jour. Oriental Med. 15: 26. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

KUNIKE, G. (140)

THE LIFE-HISTORY OF THE CONFUSED FLOUR BEETLE, *T. CONFUSUM*. Mitt. Gesell. Vorratsschutz 7: 8-11. 1931. [In German. Abstract in Rev. Appl. Ent. 19(A): 330. 1931.]

Hydrocyanic acid gas from Zyklon B is effective against the confused flour beetle if used at a concentration of 1 to 2 volume percent for 24 hours, and the flour is not affected as it sometimes is by chloropicrin.

KÜSTER, H. (141)

FORMATION OF HYDROCYANIC ACID FROM TECHNICAL GASES. Brennstoff-Chem. 12: 329-334. 1931. [Abstract in Chem. Zentbl. 102 (II): 2540. 1931.]

Formation of hydrocyanic acid during the coking process may be satisfactorily represented by the equation: NH_3 C = HCN H_2 - -39.5 Kg. Cal., although other reactions may contribute to hydrocyanic acid formation, such as the reaction of ammonia with unsaturated hydrocarbons. By passing an electrical discharge through methale-ammonia mixtures higher yields may be obtained than by thermal methods, and this reaction may be combined with the synthesis of acetylene in order to prevent the appearance of oil or carbon deposits. A partial decomposition of the methane to CH-radicals appears to be a prerequisite to the formation of hydrocyanic acid from methane and ammonia, and this does not occur in the purely thermal processes. The electric discharge also produces higher yields of hydrocyanic acid in the acetylene-ammonia system. The electrical treatment of methane-nitrogen mixtures containing excess methane yields principally acetylene; with excess of nitrogen the formation of hydrocyanic acid predominates. With a mixture containing 6.8% methane, at a pressure of 11 mm. mercury, an hydrocyanic acid yield of 911% was obtained.

LARSON, A. O. (142)

PEA-WEEVIL CONTROL IN THE WILLIAMETTE VALLEY. Ore. Agr. Expt. Sta. Circ. 99, 12 pp., 1931. [Abstract in Rev. Appl. Ent. 19(A): 578. 1931.]

The whole crop should be fumigated immediately after harvest and before it is cleaned. Notes are given on the employment of chloropicrin, hydrocyanic acid gas, and carbon disulphide, all of which are effective fumigants for peas. Carbon disulphide is the most suitable for small scale work on farms.

LAWR, C. W. (143)

PREPARATION OF HYDROCYANIC ACID FROM LIQUORS CONTAINING CYANIDE. United States Patent 1,810,487, issued June 16, 1931; applied for December 14, 1928. [Abstract in Chem. Zentbl. 102 (II): 1750. 1931.]

Cyanide solutions obtained in processing gold-silver ores containing copper are brought to neutrality with sulphur dioxide after removal of the gold and silver. After filtering, the solution is treated with more sulphur dioxide to precipitate the copper and any silver still remaining in solution. The excess sulphur dioxide liberates hydrocyanic acid.

LEFEUVRE, C., and GRÉGOIRE, F. (144)

THE ACTION OF SOME DISTILLED AROMATIC WATERS ON THE ISOLATED HEART. Bull. Sci. Pharmacol. 38: 355-365. 1931. [In French. Abstract in Chem. Abs. 25: 4622. 1931.]

Cherry laurel water in original concentration stops the heart completely, but it recovers if the liquid is soon replaced by Ringer solution. In a dilution of 1:10 a slower decrease in the amplitude is observed. Hydrocyanic acid has a delayed action but causes a sudden stop in diastole.

LEHRECKE, H. (145)

HYDROCYANIC ACID AND ITS USE IN FUMIGATION. United States Patent 1,780,196, issued November 4, 1930; applied for October 20, 1925; in Germany October 27, 1924; assigned to Roessler and Hasslacher Chemical Co. [Abstract in Chem. Abs. 25: 174. 1931.]

A finely divided addition product of hydrocyanic acid and iron chloride (with excess of iron chloride) is suitable for generating hydrocyanic acid by exposure to moist air. Calcium Chloride or magnesium chloride may also be added.

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HYDROCYANIC ACID AND ITS USE IN FUMIGATION. United States Patent 1,780,197, issued November 4, 1930; applied for October 20, 1925;

in Germany October 31, 1924; assigned to Roessler and Hasslacher Chemical Co. [Abstract in Chem. Abs. 25: 174. 1931.]

A finely divided addition product of hydrocyanic acid and iron chloride (with excess iron chloride), with the further addition of sodium hypochlorite, is suitable for generating hydrocyanic acid together with cyanogen chloride as a warning agent by exposure to moist air.

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STABILIZATION OF HYDROCYANIC ACID. Canadian Patent 276,027, issued December 6, 1927; applied for July 3, 1926. [Abstract in Chem. Zentbl. 102 (I): 1507. 1931.]

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HYDROCYANIC ACID AND ITS USE IN FUMIGATION. United States Patent 1,780,198, issued November 4, 1930; applied for June 23, 1926; in Germany July 3, 1925; assigned to Roessler and Hasslacher Chemical Co. [Abstract in Chem. Abs. 25: 174. 1931.]

Liquid hydrocyanic acid is stabilized against polymerization or decomposition by adding aluminum chloride or other suitable inorganic compound of a strong acid capable of hydrolysis under the conditions of storage of the material.

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HYDROCYANIC ACID STABILIZATION. United States Patent 1,792,103, issued February 10, 1931; applied for June 23, 1926; divided and filed July 18, 1928; in Germany July 3, 1925; assigned to Deutsche Gold- Und Silber-Scheideanstalt vorm. Roessler. [Abstract in Chem. Abs. 25: 1953. 1931.]

As a stabilizing agent there is added to liquid hydrocyanic acid a small proportion of an ester of a halogen-substituted organic acid such as ethyl bromoacetate.

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USE OF CHLOROPICRIN AS A WARNING AGENT WITH HYDROCYANIC ACID IN FUMIGATING. United States Patent 1,786,623, issued December 30, 1930; applied for June 24, 1926; in Austria July 18, 1925; assigned to Roessler and Hasslacher Chemical Co. [Abstracts in Chem. Abs. 25: 787. 1931. Brit. Chem. Abs. 1931 (B): 784. 1931.]

Hydrocyanic acid (90-95%) and chloropicrin (10-5%) are absorbed in active charcoal or kieselguhr.

LEIPERT, T., and HÄFNER, I. (151)

THE CLEAVAGE OF TYROSINE AND TRYPTOPHAN FROM CASEIN BY PAPAIN ACTIVATED BY HYDROCYANIC ACID. Biochem. Ztschr. 229: 427-432. 1930. [In German. Abstract in Chem. Abs. 25: 1545. 1931.]

Only 47% of the total nitrogen of casein is hydrolyzed as amino nitrogen in 12 days' digestion by papain-hydrocyanic acid. Tyrosine is set free entirely in proportion to the total amino acid cleavage, and tryptophan is only more or less proportional to the total hydrolysis. Under the combined action of papain-hydrocyanic acid and trypsin for a week 71% of the total nitrogen is hydrolyzed as amino nitrogen but the hydrolysis of tyrosine and tryptophan by the two enzymes together seems to be unaffected.

LINGLER, J. (152)

USE OF CALCIUM CYANIDE FOR FUMIGATION. United States Patent 1,820,394, issued August 25, 1931; applied for March 9, 1929; in Germany March 12, 1928; assigned to Deutsche Gesellschaft für Schädlungsbekämpfung M. B. H. [Abstract in Chem. Abs. 25: 5734. 1931.]

An apparatus is described in which a body of calcium cyanide is powdered by rubbing against an abrading surface and the powder then blown out of the container in which the powdering is effected.

LOCKWOOD, S. (153)

FIELD ENTOMOLOGY. Calif. Dept. Agr. Monthly Bull. 18: 761-773. 1929. [Abstract in Rev. Appl. Ent. 19(A): 420. 1931.]

Vines have been successfully fumigated against Erythroneura comes Say (grape leafhopper) by means of a tent of closely woven sacking supported on a light framework large enough to cover the new growth occurring before the end of May. Near the base of the tent a slit is cut which has a self-closing flap. Calcium cyanide applied with one stroke of a bellows-type duster killed the nymphs. The tent should be removed from the vine not later than 75 seconds after charging. The cost of one treatment was about 10s. an acre. A paste-like paint of 2-1/2 oz. calcium cyanide dust and one liquid oz. raw linseed oil, spread in a thin layer over the entrance holes through the bark, proved effective against borers.

LORMAND, C. (154)

TREATMENT OF DRIED FRUIT BY HYDROCYANIC ACID. Ann. Falsif. 24: 169. 1931. [In French. Abstract in Chem. Abs. 25: 3739. 1931.]

Investigation of the problem, following a request for authorization to use hydrocyanic acid for the sterilization of dried fruit, showed that, because of the variable moisture content of dried fruit and the possible fixation of hydrocyanic acid by the aldehyde groups of fruit sugars, there could be no assurance of complete elimination of hydrocyanic acid or even that it might not be present in toxic amounts.

LÜTGERT, H. (155)

THE DIPOLE MOMENT OF HYDROCYANIC ACID. Ztschr. Phys. Chem. 14 (B): 27-30. 1931. [In German. Abstract in Chem. Abs. 25: 5804. 1931.]

From measurement of the dielectric constant of solutions of hydrocyanic acid in benzene and xylol at different concentrations, and also at several temperatures in benzene, the electric moment was determined. A moment of 2.54×10^{-18} was obtained in benzene solutions, and 2.60×10^{-18} in xylol.

MACKIE, D. B. (156)

ENTOMOLOGICAL FUNCTIONS. Calif. Dept. Agr. Monthly Bull. 19: 831-848. 1930. [Abstract in Rev. Appl. Ent. 19(A): 691. 1931.]

A progressive increase in the use of vacuum fumigation of material for export included treatment of persimmons for export to Hawaii to prevent them from carrying Pseudococcus gahani Green. By simply changing the type of container and treating in a single layer crate, a proper diffusion and distribution of hydrocyanic acid gas at a concentration lethal to the mealybugs was obtained.

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OBSERVATIONS ON VACUUM FUMIGATION. Calif. Dept. Agr. Monthly Bull. 20: 299-315. 1931. [Abstract in Rev. Appl. Ent. 19(A): 582. 1931.]

Studies of vacuum fumigation of stored products, nursery stock, etc., for the destruction of insect pests, particularly with hydrocyanic acid gas and carbon bisulfide are described. The effect of the gases on, and their diffusion through, the articles fumigated are discussed.

MAGNIN, G. (158)

NEW TEST FOR HYDROCYANIC ACID AND ITS ALKALINE SALTS BY ITS TRANSFORMATION INTO PRUSSIAN BLUE. Jour. Pharmacol. et Chim. 14: 233-236. 1931. [In French. Cited in Quart. Cumulative Index Medicus. 10: 358. 1931. Abstract in Brit. Chem. Abs. 1931(A): 1329. 1931.

Air is drawn through the acidified solution of the substance under investigation and passed over a strip of filter paper moistened with 5% potassium hydroxide. The paper is then treated with a few drops of very dilute aqueous ferrous sulphate and a few drops of 10% hydrochloric acid. The intensity of the blue color is proportional to the amount of hydrocyanic acid present, one part hydrocyanic acid in 1,000,000 parts of solution can be detected by this method.

---------, and ZWANCK, A. (159)

CHEMICAL REAGENTS WHICH SHOULD BE USED AFTER FUMIGATION WITH HYDROCYANIC ACID. Rev. de Espicialid 5: 1961-1967. 1930. [In Spanish. Cited in Quart. Cumulative Index Medicus 9: 474. 1931.]

MAIER-BODE, R., and MAIER--BODE, H. (160)

FUMIGANTS IN INSECT CONTROL. Ztschr. Angew. Chem. 44: 415-417. 1931. [Abstract in Chem. Zentbl. 102 (II): 2201. 1931.]

A review.

MARCHLEWSKI, L. (161)

ON THE USE OF CHEMICALS IN THE FIGHT AGAINST PYRAUSTA NUBILALIS. A PRELIMINARY REPORT. Internatl. Corn Borer Invest. Sci. Rept. 3: 74-80. 1930. [Abstract in Rev. Appl. Ent. 19(A): 149. 1931.]

Experiments with hydrocyanic acid gas and ammonia showed that it is impossible to destroy the larvae after they have bored into the stalks by means of gases, since these do not penetrate into the interior of the plant.

METZGER, F. J. (162)

APPARATUS AND PROCEDURE FOR THE PREPARATION OF ALKALI-AND ALKALINE EARTH-CYANIDES. British Patent 261,722, issued January 12, 1927; assigned to California Cyanide Co. [Abstract in Chem. Zentbl. 102 (I): 1507. 1931.]

Hydrocyanic acid is reacted with a metal carbide in the presence of a small amount (0.5 - 5.0%) of water as catalyzer. For example:

$$CaC_2 + y\ HCN = Ca(CN)_2,\quad x\ HCN + C_2H_2$$

The resulting mixture may be mixed with indifferent substances (talc, infusorial earth, calcium carbonate) for use as an insecticide.

MILES, H. W. (163)

SOIL INSECTICIDES. Chem. and Drug. 114: 246-247. 1931. [Abstract in Chem. Abs. 25: 5950. 1931.]

A discussion of the uses as soil insecticides of naphthalene, cresol, commercial creosote, p-dichlorobenzene, cyanides, mercuric chloride, carbon disulphide, and formaldehyde.

MILLS, L. D., and CROWE, T. B. (164)

RECOVERY OF HYDROCYANIC ACID. United States Patent 1,809,248, issued June 9, 1931; applied for August 14, 1928; assigned to Merrill Co. [Abstract in Chem. Zentbl. 102 (II): 1750. 1931.]

The solution of metal cyanides obtained by lixiviation is acidified (sulphur dioxide) in the presence of a suitable salt (copper sulphate). The liberated hydrocyanic acid is removed by means of a gas stream (air) and collected in milk of lime.

MOKRZECKI, Z. (165)

THE BIOLOGY OF EPHESTIA ELUTELLA HB., AND THE DAMAGE IT CAUSES TO RAW TOBACCO IN STOREHOUSES, WITH MEASURES FOR ITS CONTROL. Agr. Experimentation 6: part 3, reprint 29 pp., 1930(Warsaw). [Abstract in Rev. Appl. Ent. 19(A): 382. 1931.]

Control methods include exposure to heat, or fumigation with sulphur dioxide or hydrocyanic acid gas.

MONIER-WILLIAMS, G. W. (166)

CONVERSION TABLE FOR FUMIGATION WITH HYDROCYANIC ACID. Bull. Office Internatl. Hyg. Pub. 22: 2125. 1930. [Cited in Quart. Cumulative Index Medicus 9: 474. 1931.]

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EFFECT OF PRUSSIC ACID FUMIGATION ON FOOD PRODUCTS. Bull. Office Internatl. Hyg. Pub. 23: 1065-1081. 1931. [Cited in Quart. Cumulative Index Medicus 10: 503. 1931.]

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EFFECT ON FOODS OF FUMIGATION WITH HYDROGEN CYANIDE. Analyst 56: 46-48. 1931. [Abstract in Chem. Abs. 25: 1006. 1931.]

The results of many analyses indicate the effectiveness of ventilation in removing excess hydrocyanic acid after fumigation to destroy insects and vermin pests in food, except in dried and liquid milk, dried fruit, and possibly cheese. Absorption of hydrocyanic acid is greatest in moist, finely-divided, unwrapped foods. Orange and apple skins resist absorption, while peaches and bananas are more easily penetrated. Cooking removes nearly all the absorbed gas. Foods treated with less than 1 vol. of hydrocyanic acid in 200 vols. of air and subsequently exposed to fresh air usually retain less than 20 parts hydrocyanic acid per million of food. Fertile hen eggs are killed by fumigation with 1% hydrocyanic acid at 3°C. in 4 hours, although the quantity of hydrocyanic acid absorbed is very small.

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THE EFFECT ON FOODS OF FUMIGATION WITH HYDROGEN CYANIDE. Minn. Health, Repts. Pub. Health and Med. Subjects No. 60 (1930) 32. pp. [Cited in Expt. Sta. Rec. 64: 582. 1931.]

MORETTI, P., and MUSCOLINO, G. (170)

INFLUENCE OF SOME CARBOHYDRATES ON THE TOXICITY OF POTASSIUM CYANIDE. Arch. Farmacol. Sper. e Sci. Aff. 51: 135-140. 1930. [In Italian. Abstract in Chem. Abs. 25: 2487. 1931.]

Mixtures of 4% potassium cyanide solution and glucose solution (10-30%) were allowed to stand at 37° C. for 24 hrs. When such mixtures in quantities corresponding to 2, 4, and 10 times the minimum lethal dose of potassium cyanide were injected intramuscularly into pigeons, the animals remained alive and well. It is calculated from the quantities of glucose added that 1g. of potassium cyanide is neutralized *in vitro* by 15 g. glucose, or less. After a certain period of time the potassium cyanide-glucose solutions assume a distinctly ammoniacal odor; however, the reactions of Wortmann and Pagenstecher-Schönbein remain positive. In attempting to hydrolyze the glucose in the glucose-potassium cyanide complex a mixture of potassium cyanide and glucose solution was treated with yeast. After the treatment the mixture does not reduce Fehling solution, which shows that potassium cyanide, after combining with glucose, has lost its antienzymic properties; however, its toxicity was not restored by the treatment with yeast. Similar experiments in which glucose was replaced by other carbohydrates showed that fructose, galactose, mannose, and lactose also neutralized the toxicity of potassium cyanide, while dextrin, sucrose, and gum arabic did not. Starch was only very slightly effective as a neutralizing agent.

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HEMOLYTIC EFFECTS OF POTASSIUM CYANIDE: NEUTRALIZATION BY SOME CARBOHYDRATES. Arch. Farmacol. Sper. e Sci. Aff. 51: 167-171. 1931. [In Italian. Cited in Quart. Cumulative Index Medicus 9: 337. 1931. Abstract in Brit Chem. Abs. 1931(A): 507. 1931.]

In certain concentrations and at temperatures above 37°C. potassium cyanide exerts *in vitro* a hemolytic action on the red corpuscles of ox blood. This effect is weakened when the salt combines with carbohydrates capable of neutralizing its toxic action. Strict parallelism is observed between the antitoxic and antihemolytic actions of the different carbohydrates.

MÜNCH, E., and NICOLAI, F. (172)

HYDROCYANIC ACID. German Patent 477,437, issued July 11, 1930; applied for April 11, 1936; addition to 476,662; assigned to I. G. Farbenindustrie A.-G. [Abstract in Chem. Abs. 25: 562. 1931.]

The method of 476,662 for forming hydrocyanic acid from formaldehyde or ammonium formate is modified by leading the vapor of the formaldehyde or ammonium formate through metal tubes over metal catalyzers at temperatures above 300°C. Examples are given.

MUNTSCH (173)

POTASSIUM PERMANGANATE AS AN ANTIDOTE IN ACUTE MORPHINE, COCAINE OR POTASSIUM CYANIDE POISONING. Arch. Expt. Path. u. Pharmakol. 161: 544-552. 1931. [Abstract in Chem. Zentbl. 102 (II): 3117. 1931.]

In animal experiments, which are not necessarily directly applicable to human beings, it was found that potassium permanganate injected intravenously or subcutaneously did not alter the symptoms of morphine, cocaine, or potassium cyanide poisoning.

NAVARRE, P. (174)

A CASE OF POISONING BY POTASSIUM CYANIDE IN A TAILOR SHOP. Ann. Hyg. Publ. Indus. Soc. 1930: 631-634. [In French: Abstract in Chem. Zentbl. 102 (I): 2362. 1931.]

In a tailor's workshop poisoning was caused by a 60% potassium cyanide solution, used for renovating gold braid. Poisoning symptoms disappeared upon using a 30% solution and avoiding the handling of powdered potassium cyanide.

NEMETH, L., and CSABA, M. (175)

THE TOXICITY OF POTASSIUM CYANIDE. Magyar Orvosi Arch. 30: 363-367. [In Hungarian. Abstract in Chem. Zentbl. 102 (I): 1639. 1931.]

In addition to the lethal dose, there is a so-called convulsive dose of potassium cyanide. Immediately after poisoning, potassium cyanide may be found in all the organs and body fluids. The life of poisoned animals may be prolonged for hours by oxygen inhalation; acetone has a similar effect, to a less degree.

NIETHAMMER, A. (176)

THE INFLUENCE OF NICKEL COMPOUNDS AND OF CYANIDES ON THE GERMINATION OF GRAINS. Wiss. Arch. Landw., Abt. A, Pflanze 4: 607-634. 1930. [In German. Abstract in Chem. Abs. 25: 2459. 1931.]

Grains of wheat were placed in vessels containing water, nickel sulphate, nickel nitrate, nickel chloride, nickel carbonate, nickel-potassium cyanide, potassium thiocyanate, and sodium thiocyanate solutions of 0.1, 0.5, and 1.0% and the germination was observed. Arranged in the order of injurious effects, the compounds rank $Ni(CN)_2 \cdot 2KCN Ni(NO_3)_2 NiCO_3 NiCl_2 NiSO_4$. One-tenth percent solutions of nickel nitrate and nickel sulphate accelerate germination. It was not determined whether the effect was due to physical or chemical changes, although histological examination showed that the nickel solutions penetrated to the embryo as well as the endosperm.

NISIMARU, Y. (177)

FORMATION OF BILE PIGMENT IN THE LIVER BY HEMOGLOBIN. Amer. Jour. Physiol. 97: 654-657. 1931. [Abstract in Chem. Zentbl. 102 (II): 1022. 1931.]

Addition of potassium cyanide prevented formation of the dye.

ODA, Y. (178)

THE INFLUENCE OF THE VARIOUS ENDOCRINE ORGANS ON THE HYPERGLUCEMIA AND LACTIC ACID OF THE BLOOD IN CHRONIC CYANIDE POISONING. I, II. Folia Endocrinol. Japon. 5: 11-13. [Abstract in Chem. Zentbl. 100 (II): 1560-1561. 1929. Chem. Abs. 25: 145. 1931.]

Repeated subcutaneous injection of 1% potassium cyanide solution (daily 2-6 mg. KCN per kg.) always causes an increase of sugar and lactic acid in the blood of rabbits. Simultaneous injection of insulin inhibits the increase. Adrenaline and adrenal cortex extract inhibit or nullify the increase in blood sugar and lactic acid after chronic administration of potassium cyanide. The sensitivity of the rabbits against potassium cyanide is greatly increased by choline.

OIKAWA, K. (179)

SUSCEPTIBILITY OF DOUBLY SUPRARENALECTOMIZED RABBITS TO CYANIDE. Tohoku Jour. Expt. Med. 18: 1-26. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

PACK, H. J. (180)

NOTES ON MISCELLANEOUS INSECTS OF UTAH. Utah. Agr. Expt. Sta. Bull. 216, 30 pp. 1930. [Abstract in Rev. Appl. Ent. 19(A): 69. 1931.]

A discussion of numerous insects and methods for their control. Anasa tristis DeG. (squash bug) destroys squash plants by inoculation of some toxic substance (or possibly a disease) in feeding, which causes wilting and ultimate drying of the leaves and finally of the whole plant. The best results against the bug were obtained by dusting with calcium cyanide.

PAUER, F. (181)

PREPARATION OF ACETALS. Monatsh. 58: 1-11. 1931. [In German. Abstract in Chem. Abs. 25: 4523. 1931.]

Directions are given for the preparation of anhydrous hydrocyanic acid in 95% yields; this may be kept indefinitely if a few pieces of calcium chloride are added and the flask kept in a desiccator over calcium chloride. Details are also given for the preparation of HCN:CHOEt.HCl from hydrocyanic acid, hydrochloric acid and ethyl alcohol. The hydrochloric acid salt decomposes at room temperature into ammonium chloride and formalacetal which serves for the preparation of acetals.

PETERS, G. (182)

HYDROCYANIC ACID IN CITRUS FUMIGATION. Umschau. 35: 312-315. 1931. [Abstract in Chem. Zentbl. 102. (II): 760. 1931.]

A description of tent fumigation with hydrocyanic acid evolved either by the "pot" method or from calcium cyanide.

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HYDROCYANIC ACID. German Patent 530,441, issued July 29, 1931; applied for November 2, 1929; assigned to Deutsche Gold- und Silber- Scheideanstalt vorm. Roessler. [In German. Abstract in Chem. Abs. 25: 5253. 1931.]

Compounds evolving hydrocyanic acid under the influence of moisture, e. g. calcium cyanide, are mixed with varying amounts of hygroscopic compounds, e.g. calcium chloride, whereby the rate of evolution of hydrocyanic acid is slowed down, and the period of activity of the compounds is prolonged. The mixtures may be used for fumigating greenhouses, etc.

PETERS, K., and KÜSTER, H. (184)

FORMATION OF HYDROCYANIC ACID IN THE ELECTRICAL DISCHARGE. Brennstoff-Chem. 12: 122-127. 1931. [In German. Abstract in Chem. Abs. 25: 2922. 1931.]

Yields of 70% hydrocyanic acid have been obtained when 1:1 mixtures of methane and ammonia were subjected to the electrical discharge at diminished pressures and rapid gas-flow rates. Increases in the reaction yields resulting from increases in discharge potentials agree with the calculated thermal equivalents. With 15% or less of either methane or ammonia the yields of hydrocyanic acid become quantitative when calculated for the smaller constituent of the mixture. Under high charges, excess methane and ammonia form acetylene or decompose into nitrogen and hydrogen, respectively. With a 3:7 methane-ammonia mixture a good yield of pure crystalline ammonium cyanide results. The addition of ammonia in the acetylene formation from methane prevents hydrocarbon formation without diminishing the yield of acetylene, both tar and hydrocarbons reacting with ammonia to form hydrocyanic acid. The influence of electrical charge, gas-flow rate and composition upon hydrocyanic acid yields is shown in tables and diagrams. The reaction mechanism is discussed at length.

PRATT, F. S. (185)

FUMIGATION GAS CONCENTRATIONS UNDER TENTS. Calif. Citrogr. 15: 440, 455-457, 1930. [Abstract in Expt. Sta. Rec. 64: 243, 1931.]

Leakage meter tests on canvas fabrics do not provide a reliable index of the tightness of tents when operated under field conditions. There is a marked difference between the leakage of gas from a tent and the diffusion of gas through a sample of fabric. With tents, moisture in the air plays a more important part in the factor of tent leakage than the fabric from which the tents are made. This is due to the fact that wetting the tent causes the fibers of the fabric to swell which in turn tends to close the interstices of the weave, thus making the tent tighter. Tests show that a 6.5-oz. drill tent may be just as tight as an 8-oz. U. S. Army duck tent. This is attributed to the fact that drill fabrics tend to tighten more than 7- or 8-oz. ducks. Old tents in good repair may be just as tight, if not tighter, than new tents of 8-oz. U. S. Army duck. Until shrinkage of cloth has taken place in a new tent, the gas concentrations will be lowered more rapidly by leakage than is the case with a tent that has seen one or more seasons' use. Wind movements during fumigation increase the leakage, and thus lower the efficiency of the process.

QUINN, G. (186)

FUMIGATING TOMATO HOUSES WITH HYDROCYANIC ACID GAS TO DESTROY WHITE FLY (TRIALEUROIDES VAPORARIUM). Jour. Dept. Agr. So. Aust. 34: 519-520. 1931. [Abstract in Chem. Abs. 25: 2233. 1931.]

A detailed procedure is given for the use of hydrocyanic acid as a fumigant.

RAO, R. (187)

A PRELIMINARY NOTE ON THE SUCCESSFUL TREATMENT OF THE JASMINE BUG (ANTESTIA CRUCIATA) BY DUSTING CALCIUM CYANIDE. Proc. 15th Indian Sci. Cong. 1928: 51-52. [Abstract in Chem. Abs. 25: 2801. 1931.]

Dusting with calcium cyanide was found to have the effect of stupefying the bugs on the bushes and bringing them to the ground. As a certain proportion of the bugs generally revived within a short time, these had to be hand-picked and destroyed by dropping them into kerosene covered water.

REGNIER, R. (188)

APION TRIFOLII, L., INJURIOUS TO VEGETABLE PLANTS. Bull. Soc. Sci. Nat. Rouen 44-45(7): 27-30. 1928-1929. [In French. Abstract in Rev. Appl. Ent. 19(A): 722. 1931.]

Calcium cyanide gave up to 95% mortality of the weevils when plants were treated under a bell glass, but when the latter was not used, 50-75% recovered within 45 minutes.

REICHARD, S. K. (189)

CYANOGENETIC GLUCOSIDES IN AUSTRALIAN PLANTS. II. (b) PRESENCE OF ENZYMES IN FODDER PLANTS AS A FACTOR IN THE POISONING OF STOCK. Jour. and Proc. Roy. Soc. N. S. Wales 63: 179-182. 1930. [Abstract in Chem. Abs. 25: 2455. 1931.]

The isolation of sambunigrin and prunasin has afforded the opportunity of testing, by means of these cyanogenetic glucosides, for the presence of enzymes in plants capable of decomposing them and liberating the hydrocyanic acid which they contain. Investigation of E. maculata showed that the sample of dried plant employed contained practically no enzyme, although containing a large amount of glucoside. Another plant, Heterodendron olaeifolium, proved quite similar. The significance of the presence of enzymes in fodder plants is illustrated.

REICHEL, L., and STRASSER, O. (190)

ISOMERISM OF HYDROCYANIC ACID. Ber. 64B: 1997-1999. 1931. [In German. Abstract in Chem. Abs. 25: 5893. 1931.]

The absorption of iso-amyl cyanide in heptane begins at 2329 A. U. for log k = 0 and that of iso-amyl iso-cyanide at 2725 A. U. With the purest anhydrous hydrocyanic acid (I) in heptane, no absorption could be detected up to 1935 A. U. for log k = 0 to 2.2. If it is assumed, in analogy with the similarity of the absorption curves of the CO group in ketones and aldehydes, that the replacement of the hydrogen of (I) by a hydrocarbon residue does not greatly influence the form of the curve, it may be concluded that the curve of (I) consists chiefly of a nitrile curve shifted by substitution of the hydrogen. Although the measurements do not permit of a quantitative evaluation it is probable that (I) contains at most but a few parts per hundred of the isonitrile form.

REID, J. J. (191)

APPARATUS FOR GENERATING HYDROCYANIC ACID GAS FOR FUMIGATION, ETC. United States Patent 1,806,823, issued May 26, 1931; applied for September 21, 1927. [Abstract in Chem. Abs. 25: 4083. 1931]

Structural features of an apparatus which is suitable for mixing various gas-forming reagents are described.

REPPE, W. (192)

HYDROCYANIC ACID. German Patent 511,517, issued October 30, 1930; applied for October 20, 1923; addition to 485,989; assigned to I.G. Farbenindustrie A.-G. [In German. Abstract in Chem. Abs. 25: 1339. 1931.]

In the preparation of hydrocyanic acid by the methods of 485,989 and 510,407 by heating formamide or ammonium formate or a mixture of both with indifferent gases over catalyzers, the temperature is kept above 250°C. Examples are given

RIDLON, J. R. (193)

SOME ASPECTS OF SHIP FUMIGATION. U. S. Pub. Health Repts. 46: 1572-1578. 1931. [Abstract in Chem. Abs. 25: 4644. 1931.]

Report on the use, safety measures, and comparative merits of (1) liquid hydrocyanic acid with either cyanogen chloride or chloropicrin as a warning gas and (2) Zyklon-B, which consists of an earthly substance ("diatomite") impregnated with liquid hydrocyanic acid and marketed with 5% chloropicrin as a warning gas.

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EXPERIMENTS WITH CERTAIN FUMIGANTS USED FOR THE DESTRUCTION OF COCKROACHES. U. S. Pub. Health Repts. 46: 1623-1636. 1931. [Abstract in Chem. Abs. 25: 4644. 1931.]

Zyklon-B and liquid hydrocyanic acid with 5% chloropicrin probably have equal lethal effect and are effective in killing roaches when used in the proportion of 60 g. per 1000 cu. ft. during a 2-hr. exposure. Several other combinations were tried and are reported in detail.

RIMARSKI, PLEUS, FRIEDRICH, STREB, NOACK, KEMPER, HOFFMANN, and KONSCHACK.   (195)

THE HAZARDS OF PREPARATION VERSUS THE SAFETY OF TRANSPORTATION AND HANDLING OF HYDROCYANIC ACID CONTAINING CYANOGEN CHLORIDE. A NEW ABSORPTION MATERIAL. Jahresber. Chem.-Techn. Rechsanstalt 8: 71-79. 1930. [Abstract in Chem. Zentbl. 102 (I): 2383. 1931.]

Zyklon now contains cyanogen chloride as an irritant, in addition to hydrocyanic acid. It is prepared by passing chlorine into hydrocyanic acid. In the presence of the resulting cyanogen chloride there is no danger of hydrocyanic acid being polymerized (by hydrochloric acid) to cyanuric acid. Likewise, in the gas phase, nitriles and formic acid are not sources of danger during chlorination. The formation of nitrogen chloride from the 0.1% of ammonia which is present is prevented by the decomposing effect of hydrochloric acid. Explosion experiments in lead cylinders showed that the strongest detonating caps could not induce the explosion of either hydrocyanic acid, or a mixture of hydrocyanic acid with cyanogen chloride. A new absorbent material is described, consisting of cubes of highly absorbent gypsum, with starch solution as a binder.

ROARK, R. C., and NELSON, O. A.   (196)

DENSITIES OF MIXTURES OF AIR AND VARIOUS FUMIGANTS. Jour. Econ. Ent. 23: 985-987. 1930. [Abstract in Rev. Appl. Ent. 19(A): 213. 1931.]

A formula is given for the calculation of the densities and specific gravities of saturated mixtures of air and vapors of liquid or solid fumigants. Only four of these compounds give mixtures with air that have densities less than that of pure air, and of these hydrocyanic acid is the only one commonly used against insects.

ROBINSON, M. E. (197)

CYANOGENESIS IN PLANTS. Biol. Rev. 5: 126. 1930. [Abstracts in Physiol. Abs. 15: 556. 1931; Chem. Abs. 25: 3029. 1931.]

Prussic acid, identified during the early part of the nineteenth century as a constituent of many members of the *Rosaceae*, is now known to be present in plants from about 50 natural orders. It is generally considered to exist in the plant exclusively in glucosidal combination, but certain workers postulate the existence of free cyanide. The function of prussic acid in the plant is still quite unknown, although some workers consider that cyanides represent the first stage in the synthesis of organic nitrogen by the plant. Others take the view that the cyanophoric glucosides are excretory products, or act as protective agencies in natural selection owing to their toxic properties.

ROBISON, R., MACLEOD, M., and ROSENHEIM, A. H. (198)

THE POSSIBLE SIGNIFICANCE OF THE HEXOSE-PHOSPHORIC ACID ESTER IN BONE GROWTH. IX. CALCIUM DEPOSITION IN VITRO. Biochem. Jour. 24: 1927-1941. 1930. [Abstract in Chem. Zentbl. 102 (II): 1021. 1931.]

Potassium cyanide was found to check calcium deposition, but only in the absence of the hexose-phosphoric acid ester.

ROCKWELL, P. O. (199)

PURIFICATION OF AIR. U. S. Patent 1,789,194, issued January 13, 1931; applied for March 20, 1925. [Abstract in Chem. Zentbl. 102 (I): 1799. 1931.]

Air, freed of moisture and acidic vapors, is passed through granular material (activated carbon) impregnated with hexamethylenetetramine. Activated carbon may be replaced by sodium hydroxide, potassium hydroxide, sodium sulphide, sodium carbonate, calcium hydroxide, barium hydroxide, ferric hydroxide, alkaline pumice stone, or alkaline gel. The process is especially designed to remove hydrocyanic acid or cyanogen chloride from air.

ROSENTHAL, S. M., and VOEGTLIN, C. (200)

THE EFFECT OF SULPHYDRIL, IRON- AND CYANOGEN COMPOUNDS ON THE OXYGEN CONSUMPTION OF LIVING CELLS. U. S. Pub. Health Repts. 46: 521-539. 1931. [Abstract in Brit. Chem. Abs. 1931(A): 1187. 1931.]

Neither form of glutathione influences the inhibitory effect of cyanide on respiration, whereas methemoglobin, sodium ferric tartrate, and ferrous ammonium sulphate have a slight effect, although the last two compounds do not actually accelerate oxygen consumption, nor does glutathione alone. Cyanide reacts with iron compounds and sulphur compounds of tissues as well as with the respiratory enzyme.

ROSENTHALER, L. (201)

STUDIES ON EMULSIN. Biochem. Ztschr. 235: 227-232. 1931. [In German. Abstract in Chem. Abs. 25: 4564. 1931.]

In the enzymic asymmetric synthesis in the aldehyde-hydrocyanic acid- emulsin system the optical activity may at first increase and then decrease, and this occurs in the case of all aldehydes investigated, though with varying velocities. Experiments have been performed to test the various conditions which might account for this occurrence.

RYAN, R. J. (202)

GOLDFUSH SUSCEPTIBLE TO HYDROCYANIC ACID GAS. Calif. Dept. Agr., Monthly Bull. 19: 728. 1930. [Abstract in Chem. Abs. 25: 1593. 1931.]

In two cases, orchard fumigation with liquid hydrocyanic acid caused the death of goldfish colonies in ponds located about 100 ft. from the nearest tree.

ST. IONESCO (203)

ANTHO-CYANOGEN FORMATION IN BUCKWHEAT AND CEREALS. Compt. Rend. 192: 439-440. 1931. [In French. Abstract in Chem. Zentbl. 102 (I): 3018. 1931.]

SCHECHTER, M. (204)

ROLE OF LIVER IN INTERMEDIARY METABOLISM OF CYANIDE. Ztschr. Klin. Med. 117: 637-651. 1931. [In German. Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

------- (205)

CAPACITY OF ANIMAL ORGANS FOR ASSIMILATING CYANIDE COMPOUNDS IN VITRO; MODIFICATION BY THYROID PREPARATIONS, PARTICULARLY THYROXINE. Ztschr. Klin. Med. 117: 652-656. 1931. [In German. Cited in Quart. Cumulative Index. Medicus: 10: 358. 1931.]

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CAPACITY OF LIVER FOR ASSIMILATION OF HYDROCYANIC ACID IN VITRO. Ztschr. Klin. Med. 117: 657-659. 1931. [In German. Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

------- (207)

SPLITTING OF NITRILE PORTION OF ACETONITRILE IN ANIMAL ORGANISM; MODIFICATION BY THYROID PREPARATIONS, PARTICULARLY THYROXINE. Ztschr. Klin. Med. 117: 660-663. 1931. [In German. Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

SCHMITT, F. O. (208)

THE OXIDIZING NATURE OF THE NERVE IMPULSE. Science 72: 583-584. 1930. [Abstract in Chem. Zentbl. 102 (II): 255. 1931.]

Hydrocyanic acid or carbon monoxide increases the oxygen consumption of nerves. The author concludes that a respiration enzyme is active in nerve cells, as in other cells.

------------. and SCHMITT, O. H. A. (209)

THE NATURE OF THE NERVE IMPULSE. II. THE EFFECT OF CYANIDES UPON MEDULLATED NERVES. Amer. Jour. Physiol. 97: 302-314. 1931. [Abstract in Chem. Abs. 25: 4061. 1931.]

The oxygen consumption of resting frog nerves can be practically inhibited by treatment with cyanides. The action potential is abolished when the nerve is immersed in 0.01 normal sodium cyanide about as rapidly as in nitrogen. Nerves stained with methylene blue are not protected against cyanides.

SCHUMANN, C., and FICK, R. (210)

SPRAY MATERIAL FOR CONTROL OF INSECT PESTS ON PLANTS. German Patent 529,506, issued July 14, 1931; applied for March 3, 1928; assigned to I. G. Farbenindustrie A.-G. [Abstract in Chem. Zentbl. 102 (II): 1910. 1931.]

The material consists of a suspension of calcium cyanide, magnesium cyanide, or their double compounds with ammonia, in liquids which do not decompose the cyanides and which preferably have insecticidal properties. For example, a homogeneous suspension is made of 25 parts of calcium cyanide (or the diammoniate) in 75 parts of an insecticidal petroleum fraction or coal tar oil fraction. Aliphatic or aromatic halogen compounds may also be used (ethylene chloride, carbon tetrachloride, dichlorobenzene, chloronaphthalene).

SCHWARZ, L., and DECKERT, W. (211)

PENETRATING POWER OF HYDROCYANIC ACID. Ztschr. Desinfekt. u. Gesundhw. 22: 749-758. 1930 [In German. Abstracts in Chem. Zentbl. 102 (I): 649. 1931. Rev. Appl. Ent. 19(A): 329. 1931.]

The quantity of hydrocyanic acid that has penetrated to any given point in the material fumigated is ascertained by the use of soda-lime - kieselguhr tablets placed in small perforated porcelain containers. If these are placed in flour they must be enclosed in fine silk gauze. Tablets hung in various parts of a room indicate the average concentration of the gas, and simultaneous exposures of test insects indicate; the strength required to kill them. The exposed tablets are dissolved in water and titrated with potassium iodide and silver nitrate, thus detecting as little as 0.05 mg. hydrocyanic acid. The gas has very great penetrative power, and it is unimportant whether the material be coarse like rice or fine like potato flour. Penetration into a highly absorbent material is slower than in a less absorbent one, and the gas is subsequently given up more slowly. There thus results an after-effect that may kill pests still alive when ventilation begins after fumigation. Wood is penetrated by the gas, and a tablet absorption of 2 mg. indicates a concentration sufficient to kill Hylotrupes bajulus, L.

SHOUP, C. S., and BOYKIN, J. T. (212)

CYANIDE INSENSITIVITY OF PARAMECIUM. Jour. Gen Physiol. 15: 107-118. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

SMITH, F. F., and FISHER, H. J. (213)

THE BOXWOOD LEAF MINER (MONARTHROPALPUS BUXI LABOU). Penn. Dept. Agr. Bull., Vol. 13. no. 12 Gen. Bull. 497. 14 pp. 1930. [Abstract in Rev. Appl. Ent. 19(A): 435. 1931.]

Sprays and dusts are only effective against the adults, and must be thoroughly and repeatedly applied. The bulk of the paper deals with the hot water treatment of infested nursery plants, and field experiments in the fumigation of bushes with hydrocyanic acid under tents of 12-oz. canvas treated with linseed oil. The tents are supported on wooden frames, 4 by 5 by 5 feet, to enclose 100 cu. ft. of space, and the preferred dosage was 2 oz. sodium cyanide in 6 oz. water and 3 oz. sulphuric acid. Fumigation should be carried out when the plants are in a dormant condition, that is from mid-November to March. The plants should be dry, as any form of moisture will result in foliage injury, and the temperature should preferably be between 40 and 55°F. In plants fumigated in November the larvae may appear normal until March, though apparently little feeding occurs, and they die in early April. In those treated in the spring, death occurs during May or early June.

SMITH, L. M. (214)

THE SNOWY TREE-CRICKET AND OTHER INSECTS INJURIOUS TO RASPBERRIES. Calif. Agr. Expt. Sta. Bull. 508, 38 pp., 1930. [Abstract in Rev. Appl. Ent. 19(A): 318. 1931.]

Of several propietary sprays, the best killed only about 30% of the crickets. Dormant oils proved useless as ovicides, and lime-sulphur almost so. The use of arsenical sprays or dusts is impracticable, as it would be necessary to treat the bushes while they are bearing. Calcium cyanide and nicotine dusts were tried, but were finally abandoned owing to high cost, difficulty of handling, and great variation in toxicity. Complete control, however, was obtained with a dust composed of 70% sodium fluosilicate and 30% diatomaceous earth, applied at the rate of about 50 lb. to the acre with a rotary fan blower.

SMITH, R. G., and MALCOLM, R. L. (215)

URINARY SULPHUR AND THIOCYANATE EXCRETION IN CYANIDE POISONING. Jour. Pharmacol. and Expt. Ther. 40: 457-471. 1930. [Abstract in Chem. Abs. 25: 2203. 1931.]

Rabbits on a constant diet were allowed to breathe hydrocyanic acid fumes for certain periods for a number of days. Inorganic and conjugated sulphates, neutral sulphur, and thiocyanate excretion in urine were determined. Neutral sulphur increased during cyanide administration, the increase being accounted for by excretion of thiocyanate. Inorganic sulphate decreased in most cases, so that the total sulphur was the same or less. An increase in total nitrogen caused an increase in the nitrogen-sulphur ratio. After intravenous injection of sodium cyanide, 61 to 100% of the cyanide given was recovered in the urine during the first three days as thiocyanate. Conclusions: Increased urinary neutral sulphur is due to detoxication of cyanide rather than depressed oxidation processes. Thiocyanate formation is the principal method of cyanide detoxication.

SNYDER, T. E. (216)

THE TERMITE PROBLEM IN THE PACIFIC AREA. Proc. 4th Pac. Sci. Cong. Java 1929, iv, Agr. Papers, 143-156. [Abstract in Rev. Appl. Ent. 19(A): 224. 1931.]

To destroy termites in the woodwork of buildings and boats, fumigation with hydrocyanic acid just before the insects are ready to fly is successful, using 12 oz. sodium cyanide to 18 fluid oz. sulphuric acid and 36 fluid oz. water per 1000 cu. ft. room capacity.

SOCIÉTÉ D'ÉTUDES CHIMIQUES POUR L'INDUSTRIE
AMMONIA AND HYDROCYANIC ACID. (217)

Swiss Patent 143,982, issued February 16, 1931; applied for June 3, 1929. [In French. Abstract in Chem. Abs. 25: 4092. 1931.]

Ammonia is produced with hydrocyanic acid as a by-product by passing gas containing hydrocarbons, nitrogen, and hydrogen over alkaline earth cyanamide at 200-1000°C. and under a pressure of 1-350 atmospheres. Coke-oven gas may be used. In the example, calcium cyanamide is heated to 750°C. in a tube through which coke oven gas containing methane, hydrogen, and nitrogen is passed.

SOCIÉTÉ FRANÇAISE DU GAZ SANOS (218)

USE OF HYDROCYANIC ACID GAS. French Patents 697,923 and 697,924, issued January 21, 1931 and January 23, 1931; applied for September 24, 1929. [In French. Abstract in Chem. Abs. 25: 3133. 1931.]

Apparatus is described for emitting an alarm gas along with hydrocyanic acid gas to prevent poisoning of persons thereby.

STANER, P. (219)

THE DISINFECTION OF COTTON SEEDS. Bul. Agr. Congo Belge. 21: 830-832. 1930. [In French. Abstract in Chem. Abs. 25: 3763. 1931.]

The best current practice for disinfecting cotton seeds appears to be the use of the Clayton gas apparatus or the modified Simons apparatus. Clayton gas is a mixture of sulphur dioxode and sulphur trioxide, while the Simons apparatus is based on the disinfecting properties of hot air on the dry seeds. For a complete disinfection of the seeds one of the toxic gases, chloropicrin, carbon disulphide, or hydrocyanic acid, can be used. Soaking or dusting the seeds with copper-based products offers a protection against fungus, while a similar use of arsenic-based materials destroys the insects.

STANILAND, L. N., and WALTON, C. L. (220)

A NOTE ON THE CONTROL OF WOLLY APHIS ON DORMANT NURSERY STOCK. Rept. Agr. Hort. Res. Sta. Bristol 1930: 106-107. [Abstract in Rev. Appl. Ent. 19(A): 607. 1931.]

In an experiment during 1928-1929 on young dormant apple trees, fumigation with hydrocyanic acid gas (1 oz. sodium cyanide per 100 cu. ft. for 1 hour) proved almost a complete failure.

STEWART, F. C., and GLASGOW, H. (221)

APHIDS AS VECTORS OF LEAF ROLL AMONG SPROUTING POTATO TUBERS. N. Y. Agr. Expt. Sta. Tech. Bull. 171, 21 pp., 1930. [Abstract in Rev. Appl. Ent. 19(A): 265. 1931.]

Aphids on seed potatoes may be killed without injury to the tubers by fumigation for 2 to 3 hours with tobacco dust of a high nicotine content or sodium cyanide, used at the rate of 1 oz. or 1/2 oz., respectively, per 1000 cu. ft. of space.

TAMIYA, H. (222)

STUDIES OF THE METABOLISM OF ASPERGILLUS ORYZAE. III. Acta Phytochim. 4: 227-270. [Abstract in Chem. Zentbl. 102 (I): 3249. 1931.]

Potassium cyanide inhibited both growth and oxygen-absorption.

TAYLOR, H. (223)

THE RESPIRATORY MOVEMENTS IN GRADUAL HYDROCYANIC ACID POISONING. Jour. Physiol. 69: 124-134. 1930. [Abstract in Physiol. Abs. 15: 161. 1930-1931.]

The effect of gradual poisoning by hydrocyanic acid gas upon respiration confirms the researches of Lumsden with regard to the four centers: (1) pneumotoxic, (2) apneustic, (3) expiratory, (4) gasping. In cats there is successive elimination of the first two centers by this poison; in rabbits both these centers, if they exist separately, are eliminated together, but gasping is very similar to gasping in cats. In general the effects of the gas are obtained in the same order as those given by sections of the brain stem from above downwards. Apnoea is not produced in a gasping animal by over-ventilation with air, nor do the respiratory movements stop during the act of over-ventilation; in a cat the form of the gasps is altered after artifical ventilation. Artificial ventilation with hydrocyanic acid gas mixture produces failure of the respiratory movements. Cutting the vagi appears to aid the formation of apneuses produced by hydrocyanic acid; the vagi evidently inhibit apneuses.

THOMPSON, M. R. (224)

PURIFICATION AND ANALYSIS OF ALKALI CYANIDES. Bur. Standards Jour. Res. 6: 1051-1059. 1931. [Abstract in Chem. Abs. 25: 4810. 1931.]

Sodium cyanide and potassium cyanide were synthesized from liquid hydrocyanic acid and the appropriate hydrozide or ethoxide in ethyl alcohol solution. No difficulty was encountered in producing potassium cyanide of high purity, but sodium cyanide was always less pure. This is due to differences in reactions and solubilities between sodium and potassium salts in ethyl alcohol. Recrystallization from methyl alcohol was suitable in some cases. The silver nitrate method of analysis was found to be the most accurate.

TSUKUNAGA, K. (225)

HYDROCYANIC ACID IN SORGHUM. Agr. Expt. Sta. S. Manchuria Ry Co., Res. Bull. 2: 49-58. 1931. [In Chinese. Abstract in Chem. Abs. 25: 3690. 1931.]

Andropogon sorghum Broth leaves contained 0.0358 - 0.1066 % hydrocyanic acid on moisture-free basis. Differences of hydrocyanic acid content in varieties distinguished by differences in seed color are: white 0.0587-0.0804 %, yellow 0.0358-0.0868 %, red-brown 0.0642-0.1066 %, pink 0.0542-0.0655 %, brown 0.0376-0.1066 %. Varieties which produce mealy seeds contained 0.0376-0.1066 % and glassy seeds 0.0358-0.084 %, and the varieties used for making brooms contained 0.0412-0.0455 %. Kafir and Sudan grass contained much less hydrocyanic acid than Andropogon sorghum Broth and sugar cane (0.0698-0.0722 %.)

TUCKER, R. W. E. (226)

SUGAR-CANE BORERS. THE CONTROL OF DIATRAEA SACCHARALIS IN BARBADOS BY MASS LIBERATIONS OF TRICHOGRAMMA MINUTUM. Trop. Agr. 7: 292-295. 1930. [Abstract in Rev. Appl. Ent. 19(A): 105. 1931.]

A number of pests interfere in the propagation of the parasites. amongst these, E. kühniella and H. cerealellae were destroyed by hand crushing the adults and by fumigating with just sufficient hydrocyanic acid to kill all adults and young larvae, but not the pupae of S. cerealella.

VIETORISZ, K. (227)

EFFECT OF HYDROCYANIC ACID ON RESPIRATION OF MALIGNANT TISSUE. Biochem. Ztschr. 240: 488-489. 1931. [In German. Cited in Quart. Cumulative Index Medicus 10: 358. 1931]

WARBURG, O. (228)

THE NON-INHIBITION OF CELL RESPIRATION BY HYDROCYANIC ACID. Biochem. Ztschr. 231: 493-497. 1931. [In German. Abstract in Chem. Abs. 25: 2472. 1931.]

Dixon's discovery that potassium cyanide affects only 60% of the cell respiration is shown to be based on error. Liver, kidney, and spleen cells are injured by the phosphate buffer, as used by Dixon. When these cells are experimented with in a Ringer-$NaHCO_3$ CO_2 medium their respiration is completely inhibited by potassium cyanide just as is that of yeast cells. Attention is called to several other experimental errors in Dixon's work. A number of instances are cited demonstrating that injury of the cell frequently affects the inhibition of its respiratory activity under certain conditions.

------- (229)

INFLUENCE OF HYDROCYANIC ACID ON THE CAYALYTIC ACTION OF MANGANESE. Biochem. Ztschr. 233: 245. 1931. [In German. Abstract in Chem. Abs. 25: 3552. 1931.]

A solution of cysteine in molal borate buffer of pH 9.5 becomes oxidized in the air in the presence of small quantities of manganese and this catalytic action is not noticeably inhibited by even 200 times the amount of potassium cyanide. Since iron catalysis under similar conditions is very strongly inhibited, the two types of catalyst can thus be differentiated. The manganese catalysis is incompletely inhibited even by 20,000 times as much potassium cyanide.

WENDEL, W. B. (230)

ACCELERATION OF RESPIRATION OF RED BLOOD CELLS BY CYANIDE. Jour. Biol. Chem. 92: xlvii. 1931. [Cited in Quart. Cumulative Index Medicus 10: 358. 1931.]

WICHMAUD, H. (231)

HYLOTRUPES BAJULUS L. IN DENMARK. Anz. Schädlingsk. 7: 13-16. 1931. [In Danish. Abstract in Rev. Appl. Ent. 19(A): 379. 1931.]

Infestation develops quickly under a slate roof and new breeding places are constantly sought, whereas there are tiled houses in which *H. Bajulus* has been present for a hundred years, and only a little of the timber has required replacing. Fumigation with hydrocyanic acid does not destroy all the larvae, but heat, applied by means of the plant used for drying out newly erected buildings, is stated to be satisfactory. The attic is heated to 60-70°C. (140-158°F.) from 8 A.M. to 10 P.M., and in no case has it been possible to find any living larvae after this treatment.

WIEGAND, C. (232)

DETOXICATION OF HYDROCYANIC ACID IN VIVO BY MEANS OF DIOXYACETONE AND DEXTROSE. Arch. Expt. Path. u. Parmakol. 163: 150-155. 1931. [In German. Cited in Quart. Cumulative Index Medicus. 10: 358. 1931.]

WIELAND, H., and MACRAE, T. F. (233)

MECHANISM OF OXIDATION PROCESSES. XXVI. DEHYDROGENATING ENZYMES OF MILK. Liebigs Ann. Chem. 483: 217-250. 1930. [In German. Abstract in Chem. Abs. 25: 3364. 1931.]

The effect of hydrocyanic acid on the oxidation of acetaldehyde formaldehyde, and benzaldehyde has been determined. Evidence is adduced that the same enzyme is responsible for aërobic and anaërobic oxidation in presence of methylene blue, and for dismutation. The effect of hydrocyanic acid on all three reactions is of the same order of activity.

WIERSMA, C. A. G. (234)

THE EFFECT OF POTASSIUM CYANIDE NARCOSIS ON THE NERVES. CONTRIBUTION TO THE QUESTION OF NERVE CONDUCTIVITY. Koninkl. Akad. Wetensch. Amsterdam, Proc. 33: 180-188. 1930. [In Dutch. Abstract in Chem. Zentbl. 102 (I): 107. 1931.]

Nerve conductivity in the presence of potassium cyanide differs from that in normal nerves or in nerves poisoned by indifferent narcotics.

WILDERMUTH, V. L., and DAVIS, E. G. (235)

THE RED HARVESTER ANT AND HOW TO SUBDUE IT. U. S. Dept. Agr. Farmers' Bull. 1668, 21 pp., 1931. [Abstract in Rev. Appl. Ent. 19(A): 746. 1931.]

Numerous methods of control are discussed. Calcium cyanide sprinkled about the entrance hole suspends the activities of the ants for a period of about a week or more.

WILLIAMS, C. L. (236)

FUMIGANTS, U. S. Pub. Health Repts. 46: 1013-1031. 1931. [Abstract in Chem. Abs. 25: 3118. 1931.]

The dangers attending the use of hydrocyanic acid for fumigation are discussed in particular relation to the methods usually employed for generating or liberating it. The residue from calcium cyanide remains dangerous after fumigation. Advantages and disadvantages of adding a warning gas, ways in which persons are liable to be overcome, methods of rescue and treatment, and the use of gas masks are discussed. Other fumigants are briefly mentioned.

----------- (237)

EFFECT OF FUMIGATION ON COCKROACHES ON SHIPS. U. S. Pub. Health Repts. 46: 1680-1694. 1931. [Abstract in Chem. Abs. 25: 4953. 1931.]

The object of this work is the eradication of cockroaches in living compartments on ships fumigated for the destruction of rats. Tests were made with liquid hydrocyanic acid with and without chloropicrin (warning gas); Zyklon-B; and chloropicrin alone.

----------- (238)

AIR-JET HYDROCYANIC ACID SPRAYER. U. S. Pub. Health Repts. 46: 1755-1761. 1931. [Cited in Quart. Cumulative Index Medicus 10: 503. 1931.]

------------ (239)

FUMIGATION OF LOADED SHIPS. U. S. Pub. Health Repts. 46: 1823-1826. 1931. [Abstract in Chem. Abs. 25: 4953. 1931.]

Complete details are given.

------------ (240)

REPORT ON SOME TESTS OF THE USE OF A NEW CYANOGEN PRODUCT IN SHIP FUMIGATION. U. S. Pub. Health Repts. 46: 2048-2059. 1931. [Abstract in Chem. Abs. 25: 5726. 1931.]

"HCN Discoids" consist of wood-pulp disks 3 5/8" in diameter and 3/32" thick, which are very porous and highly absorptive. It is claimed that these discoids can absorb 2 1/2 times their weight of liquid hydrocyanic acid. Details are given as to use, laboratory tests, tests on shipboard, and tests of spent discoids.

------------ (241)

METHODS AND TYPES OF FUMIGATION. Bol. Ofic. San. Panam. 10: 1291-1310. 1931. [Cited in Quart. Cumulative Index Medicus 10: 503. 1931.]

WILLSTÄTTER, R. (242)

FUMIGATING WITH HYDROCYANIC ACID. British Patent 344,394, issued March 4, 1931; applied for December 4, 1929. [Abstract in Chem. Abs. 25: 4653. 1931.]

In treating material in a closed chamber with an air current carrying hydrocyanic acid, the hydrocyanic acid is added to the gas by giving part or all of the fresh air current a fixed carbon dioxide content and then passing it over cyanide compounds such as alkali cyanides which are readily decomposed by carbon dioxide.

------------ (243)

PRESERVATION OF ANIMAL AND VEGETABLE MATERIALS. French Patent 690,886, issued September 26, 1930; applied for December 18, 1929; in Germany January 21, April 15, and September 10, 1929. [In French. Abstract in Chem Zentbl. 102 (I): 707. 1931.]

The material is exposed for an extended period to a comparatively low concentration of hydrocyanic acid (not less than 0.004 vol. %). For the preservation of meat, 25 to 100 mg. hydrocyanic acid are used per kg. of meat.

------------ (244)

PRESERVATION OF ANIMAL AND VEGETABLE MATERIALS. German Patent 515,960, issued January 16, 1931; applied for April 16, 1929; addition to 513,665. [Abstract in Chem Zentbl. 102 (I): 1846. 1931.]

(1) The concentration of hydrocyanic acid is adjusted to the amount of material being treated; for example, in preserving meat, over 20 mg. of hydrocyanic acid are used to each kg. of meat (25-100 mg. is mentioned). (2) During the preservation the temperature shall not exceed 20°C., and should preferably be 15°C. or less. (3) The material being processed is exposed in compact form to the action of hydrocyanic acid.

------------ (245)

CONSERVING ANIMAL AND VEGETABLE FOODS. German Patent 516,923, issued January 29, 1931; applied for September 11, 1929; addition to 513,665. [In German. Abstract in Chem. Abs. 25: 3097. 1931.]

In preserving food by hydrocyanic acid as described in 513,665, inert gases such as air may be present in the hydrocyanic acid current.

WOGLUM, R. S., LA FOLLETTE, J. R., LANDON, W. E., and LEWIS, H. C. (246)

HANDBOOK OF CITRUS INSECT CONTROL FOR 1931. Calif. Fruit Growers Exchange, Bul. 8, 24 pp., 1931. [Abstract in Rev. Appl. Ent. 19(A): 579. 1931.]

WOLCOTT, G. N. (247)

THE INITIATION OF ENTOMOLOGICAL EXTENSION WORK IN HAITI. Jour. Econ. Ent. 24: 131-141. 1931. [Abstract in Rev. Appl Ent. 19(A): 347. 1931.]

Reference is made to an attempt to control an outbreak of Stenocranus (Saccharosydne) saccharivorus, Westw., on sugar-cane with calcium cyanide dust.

YAGATA, H. (248)

EXPERIMENTAL STUDY ON THE INFLUENCE OF POISONOUS GASES UPON THE PIGMENT-EXCRETING FUNCTION OF THE LIVER AND THE KIDNEYS.

II. CYANOGEN. Japan. Jour. Gastroenterology 3: 80-84. 1931. [In Japanese. Abstract in Chem Abs. 25: 3084. 1931.]

In rabbits the pigment-excreting function of the liver and kidneys is injured by hydrocyanic acid poisoning. The kidneys suffer greater injuries, which increase the dye-excreting function of the liver. Similar experiments were carried out with rabbits after the administration of such liver poisons as hepatotoxin, chloroform, and phosphorous, or kidney poisons such as cantharidin, potassium chromate, or uranium nitrate. The common liver poisons seem to injure the kidneys so severely when acting with hydrocyanic acid that the liver dye excretion increases. Kidney poisons alone increase the dye excretion of the liver, but accompanied by hydrocyanic acid the liver excretion is decreased.

ZALESKI, W., and NOTKINA, L. (249)

THE QUESTION OF HEXOSE DECOMPOSITION IN PLANTS. IV. THE MECHANISM OF THE STIMULATING EFFECT OF OXYGEN UPON THE POST-MORTEM ALCOHOLIC FERMENTATION OF PEA SEEDS. Biochem. Ztschr. 213: 406-413 [Abstract in Chem. Zentbl. 102 (II): 2747. 1931.]

In a study of the stimulating effect of air on the alcoholic fermentation, the air was replaced by various hydrogen acceptors. Only methylene blue and acetaldehyde were found to stimulate the process. In a concentration of 10^{-3}. potassium cyanide repressed the fermentation (in the presence of air) to the extent of 51-54%, and completely eliminated the excess normally induced by the presence of air.

ZISCH, P. J. (250)

LETHAL GAS AS MEANS OF ASPHYXIATING CAPITAL OFFENDERS. Med.-Leg. Jour. 48: 25-27. 1931. [Cited in Quart. Cumulative Index Medicus 9: 337. 1931.]

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